Jan. 28, 1964 N. MAYER 3,119,121

JOINDER FOR KNITTED FABRICS AND METHOD OF MANUFACTURE

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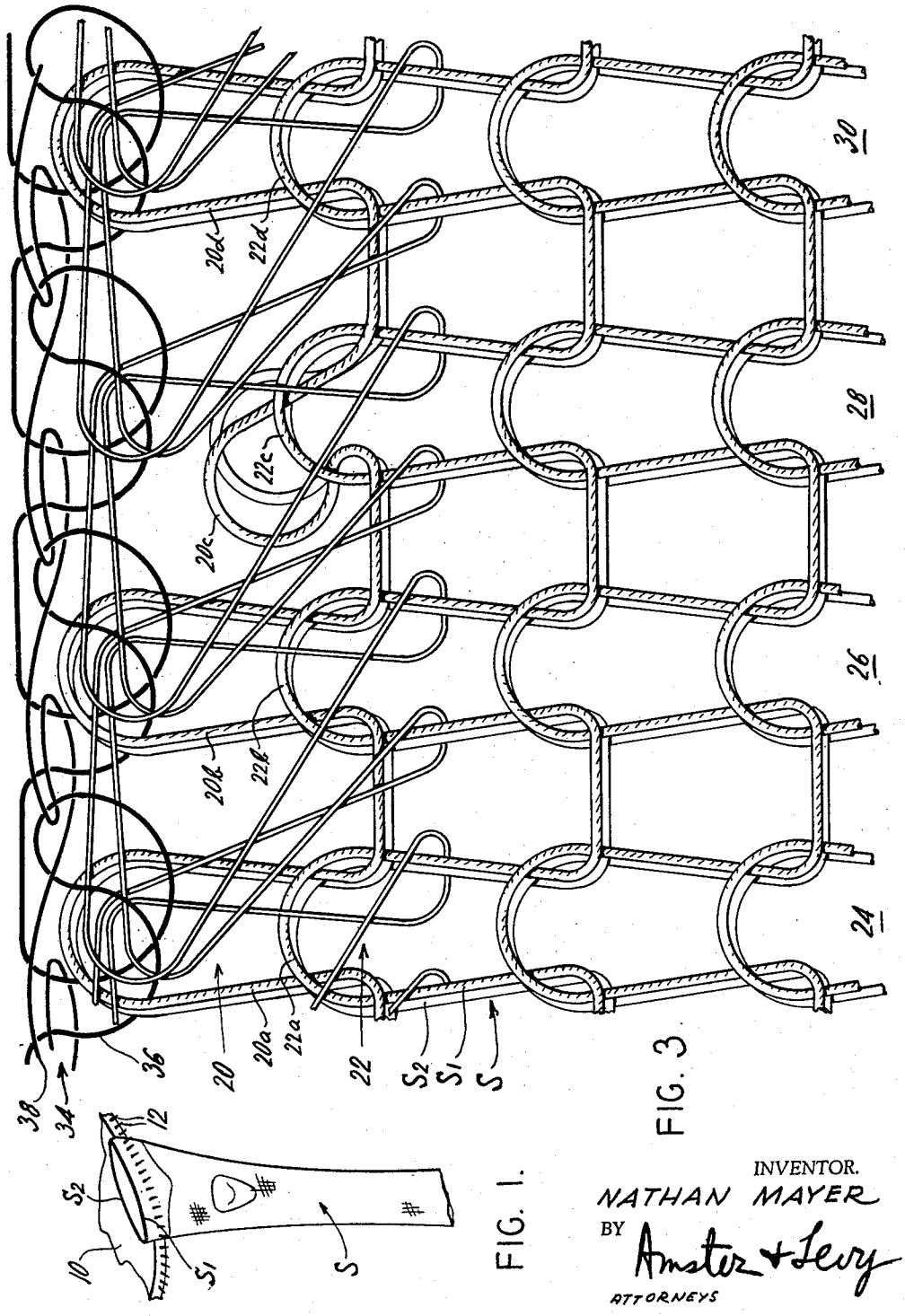


FIG. 3

FIG. 1.

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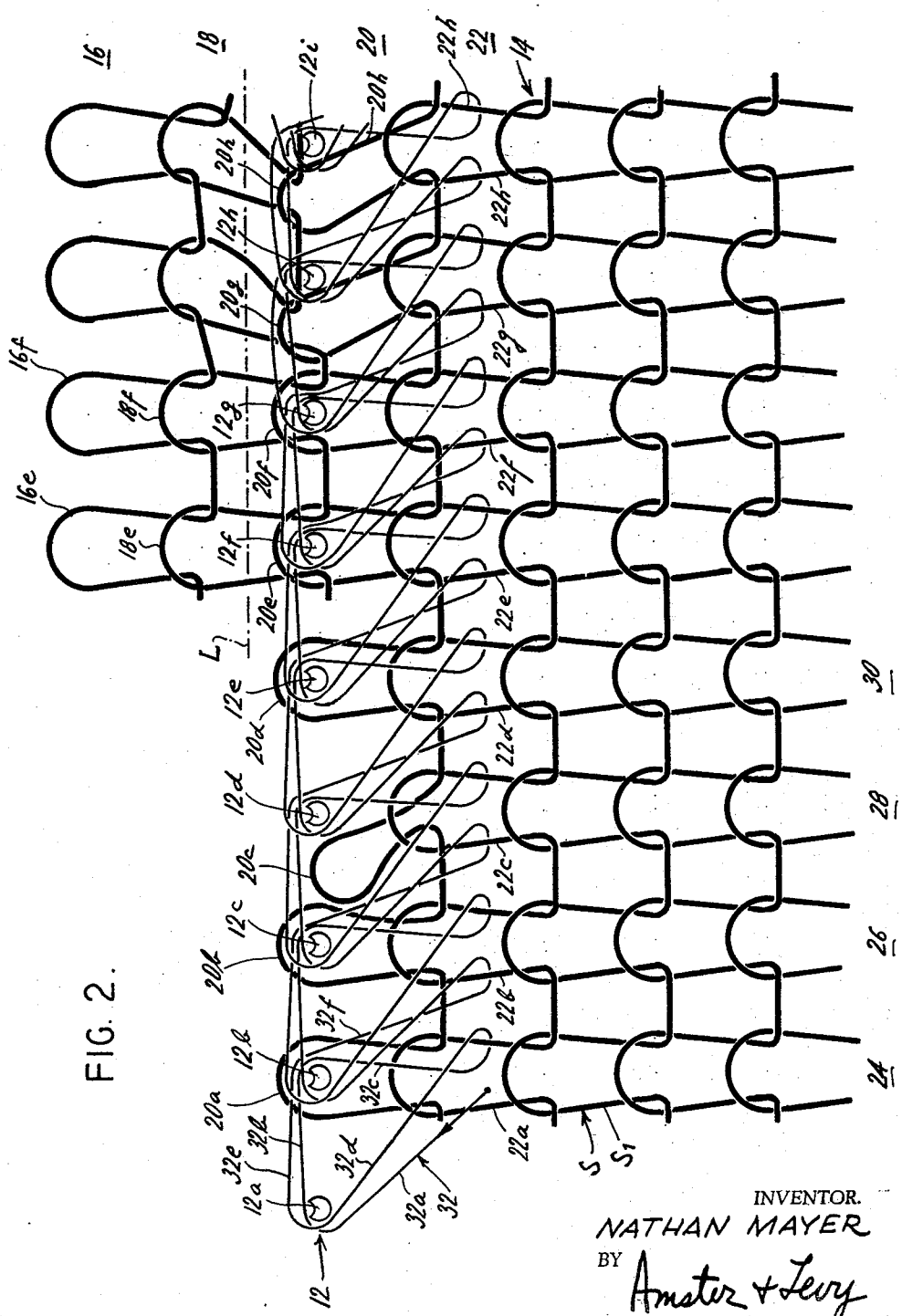


FIG. 2.

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3,119,121

Patented Jan. 28, 1964

3,119,121

JOINDER FOR KNITTED FABRICS AND METHOD OF MANUFACTURE

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Filed Jan. 16, 1961, Ser. No. 82,891
9 Claims. (Cl. 2—239)

The present invention relates generally to the joinder of circular knitted fabrics, and in particular to an improved method and means for hingedly interconnecting superposed marginal portions of a knitted fabric. My invention finds particularly useful application in the manufacture of seamless stockings of circular knit fabric.

As is generally understood, seamless stockings and similar knitted fabrics in tubular form are manufactured on a circular knitting machine having a relatively large number of needles arranged about the circumference of the machine head. The resulting elemental tubular stocking includes many hundreds of circumferential courses of loops, with the loops being chained together longitudinally of the stocking along successive circumferentially spaced and longitudinally extending wales. The seamless stocking is then completed by closing the toe opening at one end of the stocking.

In order to close the toe opening, it is the practice to employ a looping machine of the type including a rotary dial or disc having a series of radially-projecting points about the periphery thereof onto which the raw-edged superposed marginal portion of the partially completed stocking about the toe opening are impaled for joinder. As the dial or disc is rotated, the superposed marginal portions impaled upon the points are carried to stitching mechanisms which are adapted to form a looping chain through the impaled loops of the stockings. The mechanisms which form the looping chain includes a needle carrying a needle thread which cooperates with each successive point and a looper carrying a looper thread which steps through the needle thread and returns to the rear thereof such that the needle and looper threads are chained together to form the looping chain. Further means are provided in advance of the stitching mechanisms to cut off the excess material above the loops impaled on the points along the looping course which excess material is in the form of a number of selvage courses. Means may also be provided to remove the cut loops contiguous to the looping line.

In the use of this type of looping machine a relatively highly skilled operator is employed to place a single line of loops along a looping course or impaling line on the points of the dial such that each loop along the looping line is impaled on a single point, with successive loops being impaled on successive points in precise order so that none are missed and such that each point is covered by a loop. The impaling operation is continued so that each loop together with its mating loop on the overlying marginal portion is properly impaled over a single point in precise order. For example, if a stocking has four hundred loops along the looping course and about the circumference thereof, it is necessary for the operator to impale two hundred pairs of loops on the points, no more, no less, without missing a point. This rather tedious, time consuming and precise operation is somewhat facilitated by the knitting of a looping line into the stocking. The looping line or course is recognized in that it is composed of slightly larger loops which are formed by decreasing the interstices between adjacent loops such as to make the looping course or lines visible. Such looping line or course is provided approximately 12 to 15 courses before the end of the nylon fabric, with a number of lines or courses of cotton being provided thereafter such that the operator may handle the stocking with comparative

ease. It should be appreciated however that these courses outwardly of the looping line represent selvage and are ultimately removed. Needless to say a high order of accuracy and care is required in the impaling of the loops on the points. The process is inherently an expensive one in that it requires substantial time to train a looper and the employment turnover is often high due to eye fatigue and the necessity of using women with incident losses due to pregnancy, marriage and the like. The very critical nature of the work will be appreciated in that a loop which is not properly impaled upon a point along a prescribed wale of the stocking will ultimately represent a source of a run, unless corrective steps are taken in subsequent processing of the stocking to preclude the occurrence of such run.

It is broadly an object of the present invention to provide an improved method for looping contiguous edges of knitted fabrics, such as the edges of a toe opening of a seamless stocking, which obviates one or more of the aforesaid difficulties.

It has been suggested that it may be possible to join together the superposed or doubled half-edge portions of a toe opening of a stocking without strick regard as to the seriatim impalement of loops on points along a prescribed looping course, and yet be able to provide a useful joinder. To this end, the prior art teaches the joinder of the half-edged portions of the toe opening of the stocking by an auxiliary yarn which is stitched through the half-edged portions of the toe opening outwardly of and along the circumferential or transverse course which is impaled upon the points. The auxiliary thread stitched through the selvages course between the points and the rough edge of the superposed margins cooperates with the looping chain normally formed along the line of impaled loops to join together the superposed portions about the toe opening. Since such auxiliary thread occupies a number of courses outwardly of the looping or impaling line, which courses heretofore have been removed in that they represent selvage, it is no longer possible to remove those selvage courses through which the auxiliary thread passes without also removing the auxiliary thread. Normally the looping chain should join together superposed and registering loops along the looping line, with all material outwardly thereof removed, such that when the looping chain effectively serves as an unobstructed hinge, the optimum condition is that the fabric even along the line of joinder, should assume the character of a single knitted fabric wherein adjacent loops are joined together in a neat and precise manner, with virtually no bulk to interfere with the hinging action. Since in this prior art arrangement, the auxiliary thread occupies one or more selvage courses outwardly of the line of impalement, it is not possible to remove all of such selvage courses outwardly of the ultimate line of joinder and there results a somewhat bulky rolled seam. Even if the bulk of the rolled seam and its general unclean or fuzzy appearance due to entrapped cut threads rolled therein were not of themselves sufficient to preclude widespread commercial acceptance of this method of looping, there is still a further and perhaps more serious drawback in this prior art proposal. Specifically, the placement of the auxiliary thread along one or more selvage courses outwardly of the looping line does not effectively preclude the occurrence of runs. The location of the auxiliary thread does not preclude the possibility of a missed loop running along a particular wale of the stocking. Even though the possibility of running is somewhat reduced by the rolling in of missed loops along the line of joinder, this attempt at entrapment still does not give this proposal the necessary positive assurance for commerical acceptance.

It is a further object of the present invention to pro-

vide an improved joinder for the superposed marginal portions of a knitted fabric which minimizes the possibility of runs incident to the less than perfect engagement of fabric loops on the points of a looping machine. Specifically, it is within the contemplation of the present invention to provide an improved method and means of joining bargins of a toe opening in a seamless stocking which reduces the need of a high order of skill on the part of the operator, enables the manufacture of the joinder without perfect point by point engagement of fabric loops on points, virtually eliminates the possibility of a missed loop representing a source of a run, substantially reduces the unit cost for manufacture of such joinder, and substantially reduces the tedium incident to impaling the loops upon the points.

I have found that a barrier thread may be placed along a barrier course inwardly of the looping chain which joins the superposed marginal portions of the knitted fabric together. The barrier thread is picked up and locked into the looping chain and is located such that if reasonable care is exercised in impaling the loops on the points, a substantially run-free joinder is provided between the superposed marginal portions.

In accordance with method aspects of the present invention, fabric loops of the superposed marginal portions are impaled upon a series of spaced points along an impaling line substantially along a looping course which is removed from the marginal or free edges of the knitted fabric. A barrier thread is passed through the fabric loops of at least one barrier course at the side of the looping course removed from the marginal edges and about the points to provide barrier loops along the impaling line which preferably exceed in number the number of fabric loops along the looping course. When the looping chain is formed along the impaling line to interconnect the impaled and superposed fabric loops, the barrier loops are picked up and locked into such looping chain.

The above brief description, as well as further objects, features and advantages of the present invention will be more fully appreciated by reference to the following detailed description of a presently preferred method in accordance with the present invention and product attainable thereby, when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a perspective view showing the disc or dial of a typical looping machine having superposed marginal portions of a length of circular knitted fabric impaled on the points thereof;

FIG. 2 is a diagrammatic showing of a typical knitted fabric as it might be impaled along a looping course or line on the points of the disc or dial of the looping machine, with the path of the barrier thread being illustrated about a number of successive points; and

FIG. 3 is an enlarged fragmentary planned view of two superposed marginal portions of a knitted fabric joined together in accordance with the teachings of the present invention.

Referring now specifically to FIG. 1 there is shown a dial or disc **10** of a conventional and commercially available looping machine which has a plurality of spaced points **12** projecting radially beyond the periphery thereof upon which points **12** are impaled successive pairs of loops of doubled or superposed marginal portions S_1, S_2 of a length of a tubular knitted fabric, such as the seamless stocking S. For a detailed showing of a typical machine of this type, reference may be made to U.S. Patent Nos. 1,725,819 and 1,725,825 of August 27, 1929, and U.S. Patent No. 2,871,806 of February 3, 1959. Since the details of such dial-type looping machine form no part of the present invention, further description thereof is dispensed with thereof in the interest of simplicity and clarity.

Preliminary to a detailed description of the article and method aspects of the present invention, it may be best to describe the general construction of a typical piece of

tubular or circular knitted fabric. For the sake of convenience, one superposed marginal portion S_2 of the fabric S is removed in FIG. 2, leaving only the marginal portion S_1 which includes plural transversely or circumferentially extending courses of loops, four typical courses being designated by the reference numerals **16, 18, 20** and **22**. These circumferential courses of loops are linked together lengthwise of the circular or tubular knit fabric by longitudinally-extending wales, four typical wales being generally designated by the reference numerals **24, 26, 28, 30**. Each of the wales includes longitudinally aligned loops of successive courses chained together along the length of the tubular fabric. It should be appreciated that there are many hundreds of loops about any one circumferential course and many thousands of loops along the wales of the tubular knitted fabric. Each loop (i.e. loop **16*e***) along course **16**) includes opposed legs interconnected by a bight and is connected to the next adjacent loop (i.e. loop **16*f*** along course **16**) to provide an interstice between the loops **16*e*** and **16*f***. Of course the loops are chained together longitudinally (i.e. loop **16*e*** being chained through the adjacent loop **18*e*** of course **18**). Upon trimming the fabric (i.e. as represented by the cutting line L) for example incident to closing the toe opening of the seamless stocking S, the loops along the wales will be free to run unless positive provision is made to preclude disengagement of successive loops along a wale. This is accomplished by appropriately finishing the marginal edges to confine the loops against running through the provision of a joinder in the form of a looping chain which results in an articulated interconnection between the loops along such marginal edges. For the sake of convenience in describing the present invention, the circumferential courses of loops **16, 18** will be considered to be representative of the approximately five or more selvage courses which are to be removed before the linking together by the looping chain of aligned loops of the superposed margins along the looping course **20**. Such looping course will be identifiable in an actual stocking in that it includes loops that are somewhat larger than the loops of other courses. The looping course is usually located approximately five courses inwardly from the end of the nylon, there being other courses of cotton knitted into the fabric outwardly of these five selvages courses of nylon to facilitate handling.

Continuing reference will now be made to the diagrammatic showing of FIG. 2 for a description of a typical method of impaling loops on the points **12*a*** to **12*i*** inclusive of the loping dial **10** which points have been shown on a somewhat reduced scale as compared to the side of the loops (i.e. loops **20*a***) in order to more clearly disclose the invention. Normally however, it will be appreciated that the points (i.e. point **12*b***) are tightly engaged by the lops (i.e. loop **20*a***); and that on each one of the points there will be impaled a mating pair of loops, one behind the other in that the superposed marginal portions S_1, S_2 of the stocking S are concurrently impaled on successive points. Only one of the superposed marginal portions S_1 of the circular knitted fabric is shown in FIG. 2, although it is to be observed that both superposed marginal portions S_1, S_2 are shown in FIG. 3, with the rear marginal portion S_2 slightly offset to the left for the purposes of illustration. As seen in FIG. 2, there has been an attempt to impale the loops **20*a*** to **20*h*** along the looping course **20** on the points **12*b*** to **12*i*** of the dial-type looping machine. The condition shown in FIG. 2 may be considered to be illustrative of that which may be encountered with a fairly skilled operator using a reasonable measure of skill to impale the successive loops on the points. This illustrative condition is typical of what will occur in the less than perfect loop impalement and can be tolerated in accordance with method and product aspects of the invention. However, it is to be noted that the operator cannot completely disregard the necessity of attemping to attain point by point impalement.

If the operator takes reasonable precaution in stretching the fabric as the impalement is achieved to avoid the situation where a whole group of loops are forced between adjacent points, the impalement will be sufficiently accurate to achieve a useful end product in accordance with the invention. In this typical, but nonetheless illustrative example, the loop 20*c* along the looping course was not impaled on the point 12*b* of the dial 10 of the looping machine; and similarly, the loops 20*g*, 20*h* were not impaled on the points 12*h*, 12*i*. Normally, and in the absence of the positive barrier provided in accordance with the present invention, there would be a run along the wale 28 where the loops 20*c* was not impaled upon the point 12*d* and further runs along the wales containing loops 20*g*, 20*h*.

In accordance with the present invention, a barrier thread 32 is provided to join together the superposed margins S_1, S_2 along a barrier course 22 at the side of the looping course 20 remote from the rough edges and the several selvage courses 16, 18. The barrier thread 32 also is looped about the successive points 12*a* to 12*i* of the illustrated segment of the dial 10 of the looping machine. The barrier 32 is introduced by means of a curved needle (not shown) which penetrates the stocking S along the barrier course 22 (one course below the line of impalement or looping course 20) and is dropped over the points 12. Since the details of the mechanisms for introducing the barrier thread are not necessary for an understanding of the present invention, the description is omitted in the interest of brevity. The barrier thread 32 penetrates the stocking or other knit fabric at least two times for each loop along the looping course 20. In that the barrier thread 32 penetrates the knitted fabric below the points 12*a* to 12*i*, it must of necessity lock a missed loop (i.e. loops 20*c*, 20*g*, 20*h*) from running below the level of the barrier course 22 which is immediately contiguous to the looping course 20. Any missed loops along successive longitudinally extending wales (i.e. wale 28) have the barrier thread 32 running through the same. The barrier thread is loop around the points and accordingly is locked along the looping course 20 by the looping chain 34 which is stitched in along the looping course 20, as is generally understood and as will subsequently be described in conjunction with FIG. 3. The barrier thread 32 traverses the point by pairs (i.e. points 12*a*, 12*b* as a first pair, points 12*b*, 12*c* as a second pair, etc.). There is sufficient slack in the barreir thread after removal from the points such that excellent hinging of the superposed marginal portions or sections S_1, S_2 may be realized when the stocking or tubular knitted fabric is removed from the points and allowed to be restored to a flattened condition wherein the superposed margins are substantially coplanar in the region of the line of joinder.

A typical course for the barrier thread 32 in relation to several points 12*a* to 12*c* and several loops 20*a* to 20*h* will now be described in detail to further facilitate an understanding of its function and purpose. Specifically, the barrier thread 32 (insofar as the loop 22*a* along the barrier course 22 is concerned) penetrates the loop 22*a* inwardly of the left leg thereof and includes a first pass or segment 32*a* which passes upwardly and to the left about the point 12*a*. The thread 32 then has a further pass or segment 32*b* which passes from the point 12*a* to the point 12*b* in the next adjacent loop 20*a* along the looping course 20. The barrier thread then has a pass or segment 32c which passes downwardly and over the bight of the loops 22a, re-enters the loop 22a, and is wrapped around the right leg thereof. The barrier thread 32 after it passes around the right leg of the loop 22*a* includes a further pass or segment 32*d* which passes upwardly towards the point 12*a*, in the same general direction as the pass 32*a*, and about the point 12*a*. The barrier thread 32 then has a segment 32*e* which passes from the points 12*a* about the point 12*b* along a path substantially coextensive with the segment 32*b*. After passing about the point 12*b*, the barrier thread includes a pass or segment 32*f* which crosses the interstice between the loops 20*a*, 20*b* along the looping course 20 and crosses the interstice between the loops 22*a*, 22*b* where it is wrapped about the left leg of the next adjacent loop 22*b* along the barrier course 22. This completes the traverse of the barrier thread 32 in relation to the first pair of points 12*a*, 12*b* and thereupon the barrier thread provides two similar turns in relation to the points 12*b*, 12*c* and the corresponding fabric loops. In this fashion, the continuous barrier thread 32 is worked into successive loops 22*a*, 22*h* along the barrier course 22 and is impaled over the successive points 12*a*, 12*i*, with two passes or turns of the barrier thread over each pair of the points as described.

The dial 12 slowly rotates to remove the impaled stockings from the location or station where the automatic mechanisms are provided to engage the barrier thread 32 as described, and the superposed marginal portions S_1, S_2 of the stocking S with the barrier thread 32 engaged, move on to a location or station where, preliminary to forming the looping chain 34 along the looping course 20, the selvage portions outwardly of the looping course 20 are removed. The cutting away of such selvage portion is illustrated diagrammatically in FIG. 2 by the cutting line L, it being appreciated that the selvage rows 16, 18 are present at the location or station where the barrier thread is engaged although this impression may not be derived from the illustrative and diagrammatic showing of FIG. 2. If it be considered that the knitted fabric is moving from right to left in FIG. 2 and that the barrier thread 32 is engaged at a location or station somewhat to the right side of FIG. 2, the removal of the selvage courses 16, 18 will be better understood.

After the selvage courses are removed by cutting along the line L across the legs of the loops along the selvage course 18, the cut portions of the loops which remain between the impaled loops on the points are brushed away, leaving the fabric loops along the looping course 20 impaled upon the points, and of course, the associated barrier thread loops. For example, it will be appreciated that when the loops 18*e*, 18*f* are cut across, a part of the right leg of the loop 18*e* and the left leg of the loop 18*f* and the interconnecting portion thereof will be still engaged between the loops 20*e*, 20*f* impaled respectively on the points 12*f*, 12*g*. It is such uncut loops that are brushed away after cutting away of the selvage portions.

At the next location or station of the machine, the looping chain 34 is engaged along the looping course 20 and will connect together the successive superposed loops and lock the turns of the barrier thread 32 along the looping course 20. The barrier thread 32 and the further stitching 34 together hingedly interconnect the loops along the looping course 20. The chained loop 34 includes a looper thread 36 and a needle or locking thread 38 which are interlocked by stitching mechanisms, as disclosed in detail in the aforesaid patents. When the confronting or aligned pairs of mating loops are impaled upon the points as shown in FIG. 3 at the first, second and fourth pairs of loops, the interlocking looper and needle thread 36, 38 hingedly interconnect such pairs of mating loops and at the same time lock the several turns of the barrier thread 32 together along the same course or line. When however, a pair of mating or registering loops are not impaled upon the points, as shown for the third pair of loops in FIG. 3, the looper and needle threads 36, 38 of the looping chain 34 will only lock the adjacent turns of the barrier thread 32 along the looping or impaling line. However, for such missed pair of fabric loops, the barrier thread 32 is wrapped around the opposite legs of the loop along the barrier course 22 in the very same longitudinal wale 28 and will be effective to block the running of the chain of loops and the crea-

tion of the corresponding imperfection in the stocking. Effectively the interconnected looper and needle threads **36, 38** at each pair of registering fabric loops provides individual hinges flexibly interconnecting such loops. When the superposed marginal portions S_1, S_2 are brought into substantially coplanar relation, the opposite half sections of the looping course **20** will provide a relatively flat, bulkless line of joinder in which the loops are well articulated with respect to each other. For all intents and purposes, the fabric at the line of joinder will assume the character of a single knitted fabric joined together, loop by loop, in a neat and precise manner, with missed loops being blocked against running by the barrier thread **32.**

From the foregoing it will be appreciated that there has been provided in accordance with the present invention, an improved method for joining together the free edges of superposed margins of a stocking which bound the toe opening thereof. The joinder is along a circumferential looping course which is spaced from the free edges of the margins and forms a relatively flat toe seam which includes a barrier thread joining together the margins along the looping course and along at least one barrier course at the side of the looping course remote from the free edges and further chain stitching joining together the margins along the looping course. The barrier thread and further chain stitching are so interengaged with respect to each other along the looping course so as to hingedly interconnect the margins, with the barrier thread effectively precluding running yet introducing virtually no bulk into the joinder. Although the invention has been described with respect to its specific application to the manufacture of seamless hoisery, it will be appreciated that the method and article aspects herein find other useful application for joining circular knit fabrics.

A latitude of modification, change and substitution is intended in the foregoing disclosure and in some instances some features of the invention will be employed without a corresponding use of other features. Accordingly, it is appropriate that the appended claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

What I claim is:

1. In a circular knitted fabric including successive circumferential courses of loops joined together lengthwise of said fabric to provide longitudinal wales, the improvement comprising means for joining together superposed margins of said fabric along a circumferential looping course spaced from the edges of said margins, said means including a barrier thread joining together said margins along at least one barrier course at the side of said looping course remote from said edges and along said looping course, and stitching joining together said margins along said looping course, said barrier and said stitching being interengaged with each other along said looping course and together hingedly interconnecting said margins, said superposed margins intermediate said looping course and said edges being removed such that said superposed margins may be swung about the hinge provided by said barrier and said stitching and provide a relatively flat and bulkless line of joinder between said margins.

2. In a circular knitted fabric including successive circumferential courses of loops joined together lengthwise of said knitted fabric to provide longitudinal wales, the improvement comprising means for joining together superposed margins of said fabric along a circumferential looping course spaced longitudinally from the edges of said margins, said means including a barrier thread joining together said margins along at least one barrier course at the side of said looping course remote from said edges and along said looping courses and lock stitching including a looping thread and a locking thread joining together said margins along said looping course, said barrier and lock stitching being interengaged with each other along said looping course and together hingedly interconnecting said margin, said superposed margins intermediate said looping course and said edges being removed such that said superposed margins may be swung about the hinge provided by said barrier and said stitching and provide a relatively flat and bulkless line of joinder between said margins.

3. In a circular knitted fabric including successive circumferential courses of loops joined together lengthwise of said knitted fabric to provide longitudinal wales, the improvement comprising means for joining together superposed margins of said fabric along a circumferential looping course spaced longitudinally from the edges of said margins, said means including a barrier thread joining together said margins along at least one barrier course at the side of said looping course remote from said edges and along said looping course, stitching joining together said margins along said looping course, said barrier and stitching being interengaged with each other along said looping course and together hingedly interconnecting said margins, said barrier thread passing successively through one loop along said barrier course in one wale to a preceding loop along said looping course in the preceding wale, then to the one loop along said looping course in said one wale, then about said one loop along said barrier course in said one wale, then to the preceding loop along said looping course, then to the one loop along said looping course in said one wale and in similar fashion successively along said barrier and looping courses.

4. The improvement according to claim 3 wherein said stitching includes a looping chain of a looping thread and a locking thread interlocked with each other.

5. The improvement according to claim 4 wherein the several passes of said barrier thread at each loop along said looping course are engaged and locked by said looping chain.

6. A method for joining together superposed margins of a circular knitted fabric of the type including successive circumferential courses of loops chained together longitudinally of said fabric to form successive longitudinal wales of loops about the circumference of said fabric including the steps of impaling fabric loops of said superposed margins of said fabric upon a series of spaced points along an impaling line to bring the loops of a looping course spaced from the free edge of said margins in approximate registry one behind the other, cutting away said superposed margins intermediate said impaling line and said free edges to remove the corresponding selvages, stitching a barrier thread cicumferentially along said looping course to form barrier loops at the registering loops therealong and through the registering loops along at least one adjacent barrier course at the side of said looping course remote from said free edges, stitching connecting threads circumferentially through the registering loops along said looping course through said barrier loops therealong and about said barrier thread, and opening said superposed margins into substantial coplanar relation such that the interconnected loops provide a relatively flat and bulkless line of joinder.

7. A method of joining superposed margins of a knitted fabric substantially along a looping course removed from the free edges thereof comprising the steps of impaling fabric loops of said superposed margins upon a series of spaced points along an impaling line substantially along said looping course but without strict regard to perfect engagement of fabric loops on the points, cutting away said superposed margins intermediate said impaling line and said free edges to remove the corresponding selvages, passing a barrier thread through the fabric loops of at least one barrier course at the side of said looping course remote from said free edges and about said points to provide barrier loops of said barrier thread along said impaling line which exceed in number the number of fabric loops along said looping course, stitching along said impaling line to interconnect the impaled superposed fabric loops and said barrier loops along said impaling

line, and swinging said superposed margins about the hinge provided by the interconnected loops to provide a relatively flat and bulkless line of joinder.

8. A method of joining superposed margins of a knitted fabric substantially along a looping course removed from the free edges thereof comprising the steps of impaling fabric loops of said superposed margins upon a series of spaced points along an impaling line substantially along said looping course but without strict regard to perfect engagement of fabric loops on the points, cutting away said superposed margins intermediate said impaling line and said free edges to remove the corresponding selvages, passing a barrier thread through the fabric loops of at least one barrier thread through the fabric loops of at least one barrier course at the side of said looping course remote from said free edges and about said points to provide barrier loops of said barrier thread along said impaling line which exceed in number the number of fabric

loops along said looping course, forming a looping chain along said impaling line which interconnects the impaled superposed fabric loops and said barrier loops along said impaling line, and opening said superposed margins into substantial coplanar relation such that the interconnected loops provide a relatively flat and bulkless line of joinder.

9. The method according to claim 8 including the step of brushing away the cut loops after cutting away the selvages to leave only those fabric loops which are impaled on said points.

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