

Sept. 12, 1950

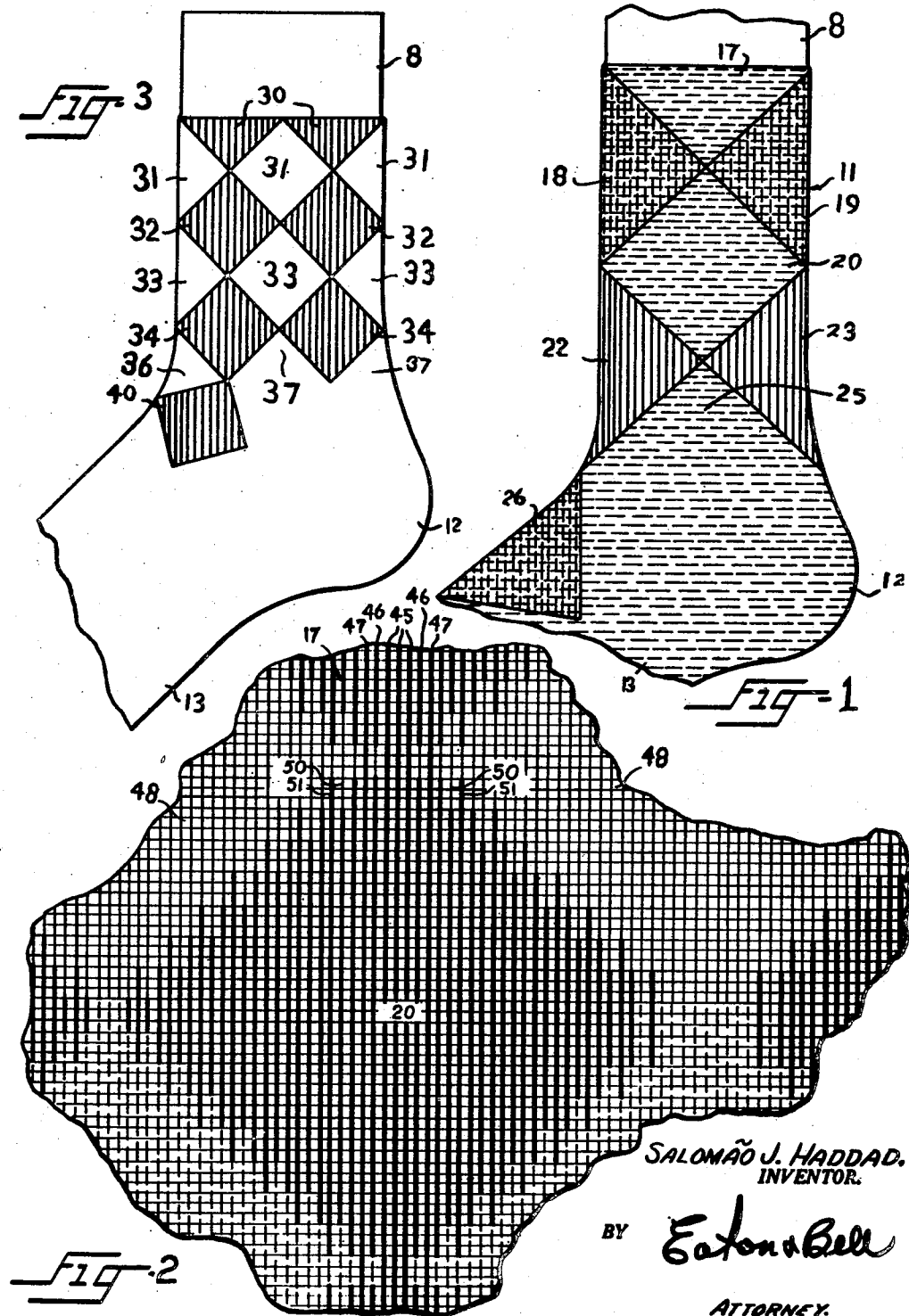
S. J. HADDAD

2,522,265

STOCKING STRUCTURE AND METHOD OF MANUFACTURE

Filed July 12, 1950

2 Sheets-Sheet 1



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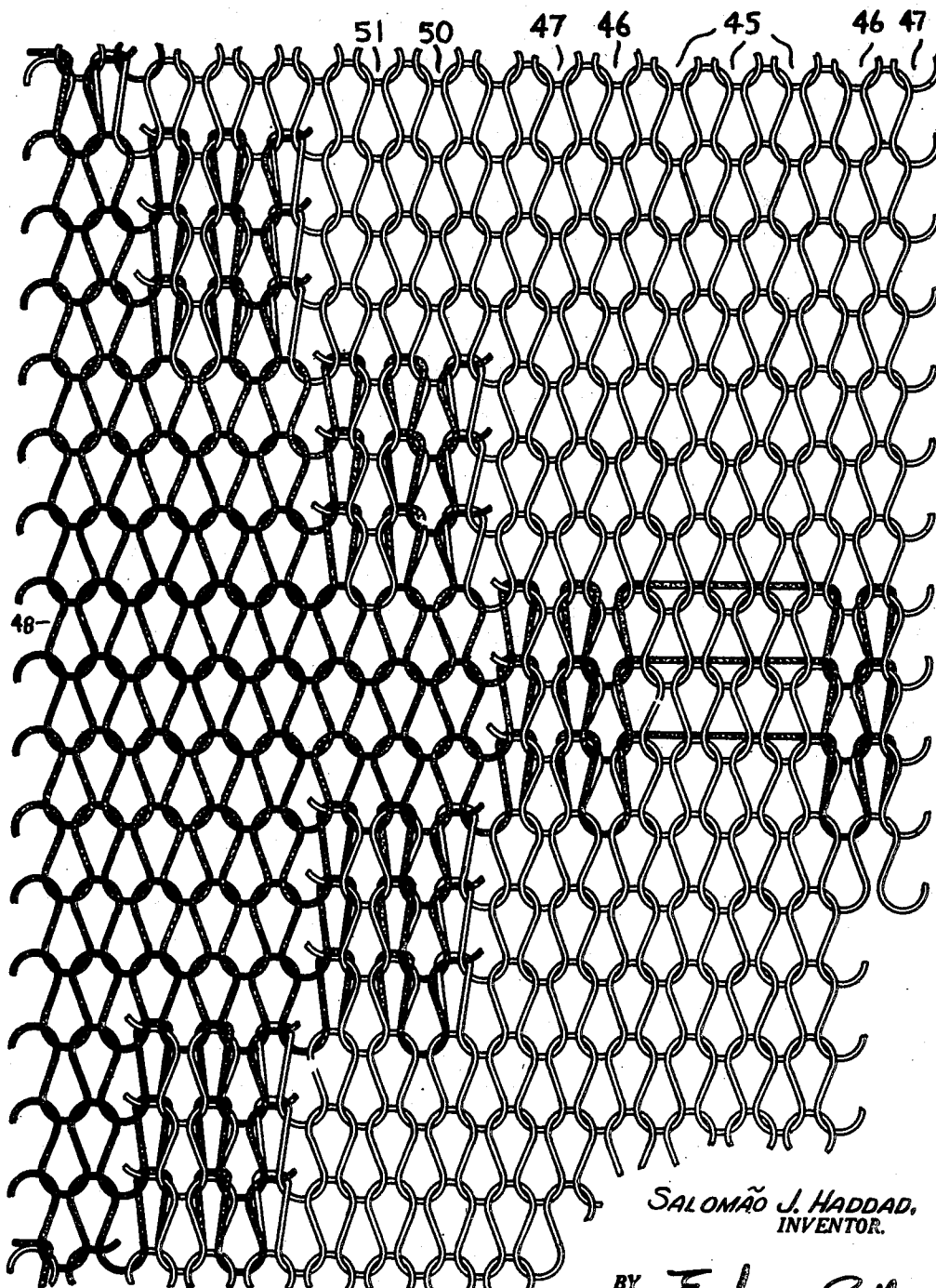
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STOCKING STRUCTURE AND METHOD OF MANUFACTURE

Filed July 12, 1950

2 Sheets-Sheet 2



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FIG - 4

UNITED STATES PATENT OFFICE

2,522,265

STOCKING STRUCTURE AND METHOD OF
MANUFACTURE

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Application July 12, 1950, Serial No. 173,350

13 Claims. (Cl. 66—180)

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This invention relates to tubular knit fabric and more especially to an improved stocking structure and wherein the leg and foot portions of the stocking include the so-called "Argyle" patterns.

Heretofore in the manufacture of stockings having variegated rectilinear, zig-zag or diamond-shaped argyle patterns wherein various rectilinear portions have been knitted of different colored yarns in the same courses, these stockings have been manufactured by plating or it has been necessary to form a suture or seam in one or more of the wales extending from one end of the leg portion of the stocking to the other in order to produce the desired ornamental appearance in the stocking.

It is an object of this invention to provide an improved stocking, sock or the like wherein the leg portion of the stocking, and in some instances the instep thereof, is formed of a plurality of yarns extending in each of a plurality of courses, preferably of different colors and so knitted as to form a plurality of rectilinear, zig-zag or diamond-shaped areas often termed an "Argyle" pattern.

It is another object of this invention to provide, in a stocking structure of the type heretofore described, an improved manner of knitting the junction points of two or more yarns in a single course so the stitches formed of at least one first yarn are interknitted in overlapping relation to simultaneously formed stitches of at least one second yarn, the first yarn being floated back of the second yarn or yarns being knitted between the junction points of the knitted areas, and, as each succeeding course is knitted, the number of stitches formed of the first yarn may be increased or decreased and the number of stitches formed of the second yarn may be respectively decreased or increased from course to course to thus form a suture extending at an angle relative to the wales and courses at the juncture of two adjacent rectilinear areas of different yarns, wherein the stitches at the juncture are overlapped and formed simultaneously.

This application is a continuation-in-part of my co-pending application entitled Apparatus for Knitting Float Patterns, Serial Number 80,273, filed March 8, 1949, Patent No. 2,516,697, issued July 25, 1950.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings in which:

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Figure 1 is a diagrammatic side elevation of a stocking with a portion of the foot thereof broken away and showing an "Argyle Diamond" pattern which is one of many which may be produced embodying the features of the present invention;

Figure 2 is a schematic diagram showing an enlarged portion of the fabric at the medial portion of the stocking shown in Figure 1;

Figure 3 is another diagrammatic side elevation of a stocking with a portion of the foot thereof broken away and illustrating another pattern which may be produced to include the features of the present invention;

Figure 4 is a greatly enlarged elevation showing a portion of the fabric at the central portion of Figure 1 and showing some of the floated yarns cut away and some of the floated yarns remaining as an integral part of the fabric.

Referring more specifically to the drawings, Figure 1 shows a stocking comprising a welt portion 8, a leg portion broadly designated at 11, a heel portion 12 and a foot portion 13, the foot portion 13 being partially broken away since the portion of the foot 13 not shown is knitted in a conventional manner.

Although only one side of the stocking is shown in Figure 1, it is to be understood that both sides of the stocking have the same ornamental appearance. Referring to Figure 1, following the knitting of the welt 8 of the stocking, there would first be knitted a gusset portion or the lower half of a diamond 17 on each side of the stocking, only one of which is shown in Figure 1, and while the gusset portions 17 are being knitted the upper halves of rectilinear portions or diamonds 18 and 19 would be knitted, these rectilinear portions 18 and 19 being knitted of a different yarn, preferably of a different color, than the yarn employed in knitting the gussets 17.

While the lower halves of the diamonds 18 and 19 are being knitted, the upper half of a rectilinear portion or diamond 20 on each side of the stocking in Figure 1 is also being knitted, this diamond 20 also being of a different yarn than the diamonds 18 and 19. The gussets 17 and the diamonds 20 are shown as being of the same color of yarn in Figure 1 but may be of any desired color and may also differ one from the other. As the lower halves of the diamonds 20 are knitted, the upper halves of front and rear respective diamonds 22 and 23 are knitted, these diamonds 22 and 23 being shown in Figure 1 as though knitted of a different colored yarn from

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the diamonds 18, 19 and 20 although it is to be understood that the diamonds 22 and 23 may be knitted of the same color as the diamonds 18 and 19 if so desired.

As the lower halves of the diamonds 22 and 23 are knitted, a gusset 25, preferably of a contrasting color of yarn to that of the diamonds 22 and 23, is knitted, after which the heel and foot portions 12 and 13, respectively, of the stocking are knitted, preferably of the same color yarn as that of the gusset 25 appearing on each side of the stocking as shown in Figure 1. After the heel pocket is knitted, if so desired, a diamond or rectilinear portion 26 may be knitted, this diamond 26 also being knitted of a yarn in contrasting color to the yarn employed in knitting the foot portion 13 of the stocking. It is evident that the gussets 17 and 25 and the diamonds 18, 19, 22, 23 and 26 may be knitted of many different desired contrasting colors and, for purposes of description, we will assume the diamonds 18, 19 and 26 to be knitted of a yellow yarn, the gussets 17, 25 and the diamond 20 being knitted of a grey yarn and the diamonds 22 and 23 being knitted of a red yarn.

Figure 3 shows another type of pattern on a stocking, the various parts of the stocking being identical to the stocking shown in Figure 1 with the exception of the pattern appearing thereon and like reference characters will apply to the stocking shown in Figure 3 as those applying to the stocking shown in Figure 1. In the case of knitting a pattern such as that shown in Figure 3, only two colors of yarn are used and the various design portions of the stocking shown in Figure 3 will be knitted in a manner identical to the design portions of the stocking shown in Figure 1.

In the form of stocking shown in Figure 3, the same style of knitting will be carried out as in knitting the stocking shown in Figure 1 except only two yarns are used and the number of diamonds are doubled from that shown in Figure 1, that is, after the welt 8 in Figure 3 is knitted, the lower halves of four diamonds or gussets 30 are knitted while the upper halves of four diamonds 31 of contrasting colored yarn to that of the gussets 30 are knitted. Then, while the lower halves of the diamonds 31 are knitted, the upper halves of diamonds 32 are knitted and while the lower halves of the diamonds 32 are knitted, the upper halves of diamonds 33 are knitted. While the lower halves of the diamonds 33 are knitted, the upper halves of diamonds 34 are knitted and while the lower halves of the diamonds 34 are knitted, the upper half of a diamond 36 is knitted and also gussets 37 are knitted. While the lower half of the diamond 36 is knitted, the upper half of the diamond 40 is knitted and following the knitting of the upper half of the diamond 40, the lower half is knitted while the remaining circular courses are knitted in the forming of the leg portion prior to the knitting of the heel pocket 12 of the stocking shown in Figure 3. The foot portion 13 of the stocking is then knitted in the usual manner.

The stockings shown in Figures 1 and 3 exemplify two of many different designs which may be knitted by continuous rotary knitting to include the particular stitch formations to be later described in detail.

Figure 2 is shown schematically and is representative of the diamond 20 in the medial portion of Figure 1. Assuming the gusset 17 at each side of the stocking shown in Figure 1 to have

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been knitted of a grey yarn simultaneously with the upper halves of the front and rear diamonds 18 and 19 having been knitted with a yellow yarn and, also, assuming that the diamond 20 at each side of the stocking shown in Figure 1 is to be knitted of a gray yarn, the gray yarn is knitted at three wales designated at 45 (Figures 2 and 4) and both the yellow and gray yarns would be knitted in the two wales 46 and 47 on each side of the wales 45 in a course 48 to interlock the yellow and gray yarns prior to the yellow yarns in the diamonds 18 and 19 and the gray yarns being floated.

After about three courses are knitted, during which the gray yarn from the gusset 17 is knitted in the wales 45, 46 and 47 and, also during which the yellow yarn from the diamonds 18 and 19 is knitted into the wales 46 and 47, as well as all of those wales extending in opposite directions from remote sides of the wales 47, then about three additional wales are knitted in the next succeeding three additional courses on each side of the wales 47. It will be noted in Figure 2 that the next to the outermost of the loops or stitches knitted in these last-named courses on each side of the diamond 20 have the yellow thread appearing on the outside of wale 50 while the gray thread appears at the outside of wale 51 in which the two colored yarns are knitted simultaneously to produce the effect which is shown in Figures 2 and 4. This is continued, that is the knitting of three courses and the widening to include three additional loops of a particular color, which in this instance is gray, to fill out the upper half of the diamond 20 and the diamonds 22 and 23 are knitted in the same manner as above described for the beginning of diamond 20 and then the reverse action appears in the lower half of the diamond 20 as described for the upper half thereof.

These illustrations are merely given in order to show how the knitting takes place and why it is that the sets of tie-in stitches added in every three courses in forming a particular diamond will have the color of the adjacent diamond, which is yellow in this instance, appearing on the outside of the fabric at one of the stitches adjacent the edge of the diamond, due to the fact that a yarn upon starting to float behind another yarn will assume a lower position relative to the next yarn. This displacement is accentuated at the edge of each float and thus produces a reverse plating effect.

It will be observed in Figure 4 that in knitting the lower portion of a diamond such as the gusset 17 of Figure 1 between adjacent upper portions of diamonds such as the diamonds 18 and 19 in Figure 1 of a different yarn used in knitting the gusset 17, each course is formed or knitted of two or more yarns, a first yarn forming a portion of each course and a second yarn forming another portion of each course and both of the yarns being knitted simultaneously at their junction point for a plurality of wales to thus tie-in the proximate portions of the yarns in each course. It is evident that the first yarn is floated past the second yarn during the knitting of that portion of each course formed by the second yarn and the second yarn is floated past the first yarn in the knitting of that portion of each course formed by the second yarn.

Although this structure need not necessarily be restricted to the specific number of courses knitted by each yarn before narrowing with one yarn and widening with the other yarn, it may

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be observed in Figure 4 that approximately three courses are knitted of each yarn successively wherein the terminal loops of the yarns are disposed in substantially the same wales to form a step, the yarns knitting in different portions of each course and being overlapped at their juncture, and then a succeeding step is formed wherein the number of loops formed of the first yarn are decreased at each side of a gusset 17 for approximately three wales while the number of loops formed of the second yarn are increased for the same number of wales to thus offset the overlapping stitches in the succeeding three courses to those three courses first described, these steps being repeated to thus produce a suture which extends diagonally with respect to the wales and courses of the stocking between adjacent rectilinear areas.

It will be observed in Figure 4 that the lower half of a diamond of one particular yarn is connected to the upper half of the next adjacent diamond therebelow by approximately three wales between the wales at which both of the yarns are knitted simultaneously and it is preferable that the floated yarns in back of these three wales shown in the central portion of Figure 4 remain a part of the finished fabric while the rest of the floated yarns, that is, yarns which extend for more than three wales, are cut away substantially as shown.

It is to be understood that, throughout the specification wherever rotary knitting or circular courses are referred to, the respective yarns may be knitted by hand and this would eliminate the necessity of floating the yarns between the points at which they are interknitted since they could be cut away while knitting. It is thus seen that a suture is formed between two adjacent knitted areas, wherein the areas are knitted of different yarns, the suture extending at an angle relative to the wales and courses of the fabric. This results in a fabric being knitted of two different yarns without the necessity of platting and wherein only a single thickness of yarn may be included in each area. This, also, results in a smooth suture and a neat, colorful appearance in the knitting of variegated patterns.

In the drawings and specification there has been set forth a preferred embodiment of the invention and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. A knitted hose having at least a first and a second adjacent rectilinear area knitted in continuous circular courses of first and second respective yarns independently of each other, the yarns being interknitted in the same loops at their juncture, the first yarn being floated past the knitted area formed to the second yarn and the second yarn being floated past the knitted area formed of the first yarn to form a suture adjacent knitted areas, such suture being formed in steps, each step including a plurality of courses terminating in the same wale at one edge of an area, and the number of loops formed of each of the yarns in the courses of each step varying from step to step.

2. A tubular knitted article in continuous circular courses and having a plurality of rectilinear areas disposed in circumferential rows and whose proximate edges extend at an angle relative to the wales and courses of the knitted fabric and whose

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edges are interknitted with the edges of adjacent rectilinear areas to form a suture therebetween, the adjacent rectilinear areas being knitted of different yarns, the yarn of a first of the rectilinear areas being floated past the yarn of a second of the rectilinear areas and vice versa and the yarns being interknitted at their juncture in overlapping relation to each other, the loops of the yarn in the first area increasing from course to course and the loops formed of the yarn in the second area decreasing accordingly.

3. A tubular knitted article having a plurality of areas knitted from different yarns and having at least two parallel edges and whose edges extend at an angle relative to both the wales and the courses of the knitted fabric, the yarns of two adjacent areas being interknitted for a plurality of loops in each course at the edges of adjacent areas to form a suture therebetween, the yarn of the first of the areas being floated past the yarn of a second of the areas and vice versa, the loops formed of the yarn in the first area increasing from course to course and the loops formed of the yarn in the second area decreasing accordingly.

4. A seamless knitted hose formed of a plurality of yarns knitted in a plurality of continuous circular courses, each course comprising a plurality of independent loops of a first yarn disposed in spaced areas and a plurality of independent loops of at least one second yarn between said spaced areas, a few of the terminal loops of both the first and second yarns being interknitted and overlapping each other for a few wales in each course, the number of independent loops formed from each yarn in successive courses varying from course to course and the wales in which said terminal loops are disposed also varying from course to course.

5. A seamless knitted hose having a leg portion knitted from a plurality of yarns, each of the yarns defining an area and the proximate edges of two adjacent areas extending at an angle relative to both the wales and the courses of the knitted hose, said yarns being interknitted for a plurality of wales in the same courses at the proximate edges of adjacent areas to form a suture of overlapping loops, the yarn from one knitted area being floated past the knitted areas of the other yarns between its sutures and vice versa, and the number of loops formed of each yarn varying either side of a given wale from course to course.

6. A seamless knitted hose having a leg portion knitted from a plurality of yarns, each of the yarns defining an area and the proximate edges of two adjacent areas extending at an angle relative to both the wales and the courses of the knitted hose, said yarns being interknitted for a plurality of wales in the same courses at the proximate edges of adjacent areas to form a suture of overlapping loops, the yarn from one knitted area being floated past the knitted areas of the other yarns between its sutures and vice versa, the number of loops formed of each yarn varying either side of a given wale from course to course, the overlapping loops of each interknitted yarn terminating in substantially the same given wale for a plurality of courses to form a step and the loops of each yarn in an adjacent plurality of courses terminating in substantially a same wale spaced from the said given wale to form another step.

7. That method of knitting a stocking having continuously knitted courses which includes knit-

ting a predetermined number of first independent loops of a first yarn at spaced intervals in a single course while floating a second yarn back of the first loops and selectively knitting either of the yarns at times in independent wales and at other times in the same wales in the same course and varying the number of loops formed independently of either yarn in a series of successive courses thereto to determine the pattern and whereby the interknitted yarns will tie the adjacent independent loops knitted of the first and second yarns together.

8. A method of knitting hosiery having a plurality of areas knitted from different yarns and the juncture of adjacent areas extending at an angle relative to both the wales and the courses of the knitted fabric which includes knitting the areas in continuous courses, interknitting the terminal loop of each yarn from two adjacent areas simultaneously in each successive course and increasing the number of loops knitted by a first of the yarns from course to course while accordingly decreasing the number of loops knitted from a second of the yarns to cause the terminal loops of each yarn in each successive course to be offset in a different wale from the terminal loops of the two yarns in preceding courses and floating the first yarn back of the second yarn and vice versa between the points at which the loops are interknitted to form a suture extending at an angle relative to the wales and courses of the knitted fabric between two adjacent areas of different yarns.

9. A method of knitting hosiery with areas of different yarns whose junctures extend at an angle relative to the wales and courses of the fabric being knitted which includes knitting the areas in continuous courses from at least a first and a second yarn, knitting one of said areas from the first yarn and knitting the next adjacent of said areas from said second yarn and interknitting the first and second yarns at their junctures and also floating the second yarn past the area knitted from the first yarn and vice versa and varying the number of loops knitted from either yarn either side of a predetermined wale to form a suture extending at an angle relative to both the courses and the wales of the knitted fabric between adjacent knitted areas.

10. That method of knitting a seamless stocking having continuous circular courses which includes forming a plurality of courses by knitting at least one first yarn at spaced areas in each course and knitting at least one second yarn between said spaced areas so as to cause the second yarn to float past an area knitted by the first yarn and vice versa, interknitting the first and second yarns at their juncture for a few wales in each course and varying the number of stitches formed by each yarn from course to course.

11. A method of knitting a tubular fabric having continuous courses including knitting a plurality of yarns to form independent groups of

loops from each of the yarns during each successive course, overlapping and interknitting a few of the terminal loops in adjacent groups of loops while floating the yarns which are not being knitted in particular groups of loops between the points at which they are interknitted with the loops of another group and increasing the number of loops of certain of the yarns while decreasing the number of loops of the adjacent yarns to form a suture extending at an angle relative to the wales and courses of the knitted fabric.

12. A method of knitting hosiery having a plurality of areas knitted of different yarns and the juncture of said areas extending at an angle relative to both the wales and the courses of the knitted fabric which includes knitting the areas in continuous courses, interknitting a plurality of the terminal loops of each yarn from two adjacent areas simultaneously in each successive course and increasing the number of loops knitted by a first of the yarns from course to course while accordingly decreasing the number of loops knitted from a second of the yarns and thus causing the terminal loops of each yarn in each successive course to be offset in different wales from the terminal loops of the two yarns in preceding courses and floating the first yarn back of the second yarn and vice versa between the points at which the loops are interknitted to form a suture extending at an angle relative to the wales and courses of the knitted fabric between two adjacent areas of different yarns.

13. A method of knitting hosiery with areas of different yarns whose junctures extend at an angle relative to the wales and courses of the fabric being knitted which includes knitting the areas in continuous courses from at least a first and a second yarn, knitting one of said areas from the first yarn and knitting the next adjacent of said areas from said second yarn and interknitting the first and second yarns at their juncture for a plurality of loops in a course and also floating the second yarn past the area knitted from the first yarn and vice versa and varying the number of loops knitted from either yarn either side of a predetermined wale to form a suture extending at an angle relative to both the courses and the wales of the knitted fabric between adjacent knitted areas.

SALOMAO J. HADDAD.

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The following references are of record in the file of this patent:

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2,260,650	Allen	Oct. 28, 1941
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Certificate of Correction

Patent No. 2,522,265

September 12, 1950

SALOMAO J. HADDAD

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 5, line 43, for "plattng" read *plating*; line 62, for the words "formed to" read *formed of*; line 65, for "such" read *said*; line 71, after "article" insert *knitted*; column 6, line 20, for "the first" read *a first*;

and that the said Letters Patent should be read as corrected above, so that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 12th day of December, A. D. 1950.

[SEAL]

THOMAS F. MURPHY,

Assistant Commissioner of Patents.