Dec. 3, 1963 N. LEVIN 3,112,628

PATTERNED HOSIERY

Original Filed May 15, 1956 4 Sheets-Sheet 1

Fig. 1

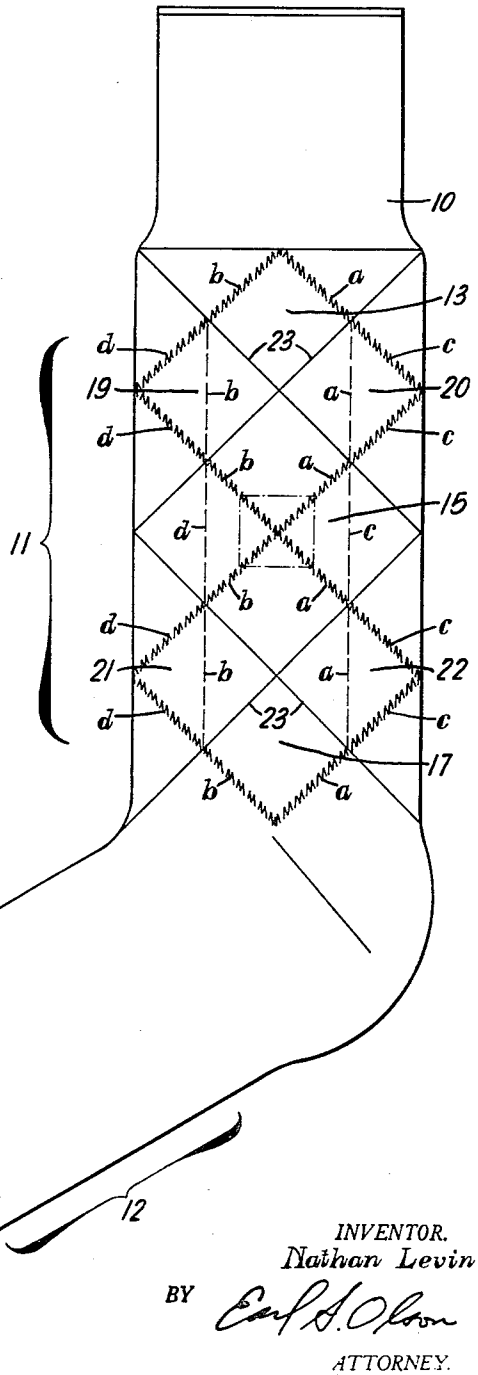
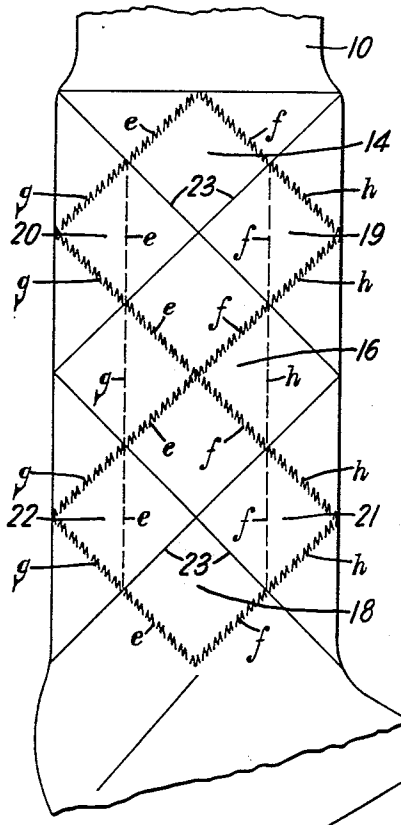


Fig. 2



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Dec. 3, 1963 N. LEVIN 3,112,628

PATTERNED HOSIERY

Original Filed May 15, 1956 4 Sheets-Sheet 2

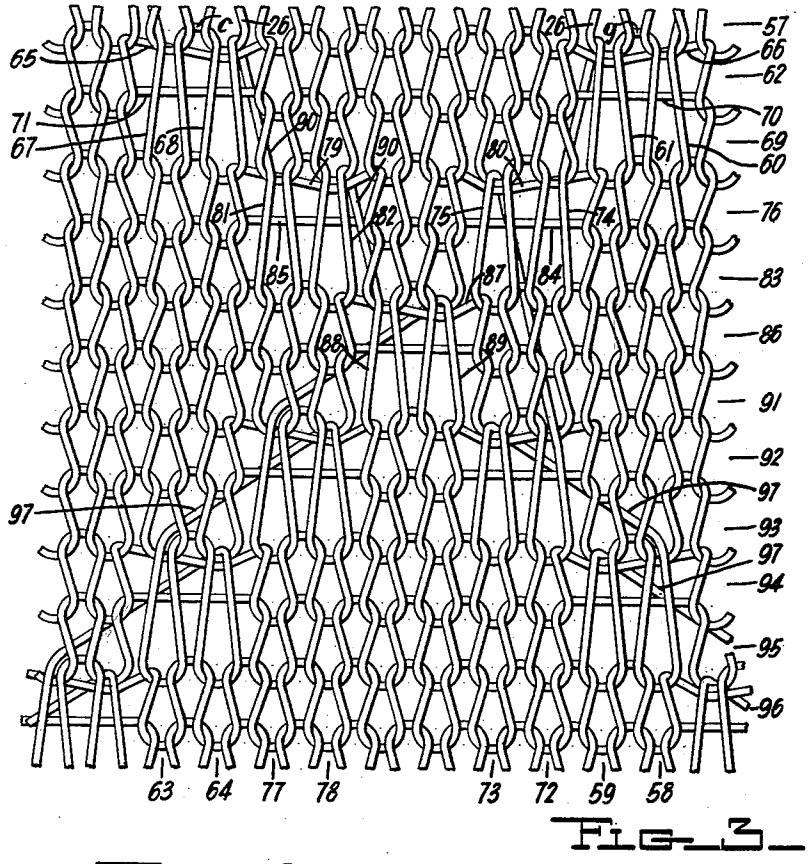
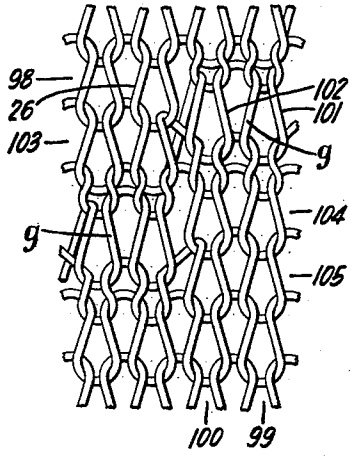


FIG. 3

FIG. 4



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Dec. 3, 1963 N. LEVIN 3,112,628

PATTERNED HOSIERY

Original Filed May 15, 1956 4 Sheets-Sheet 3

FIG. 5

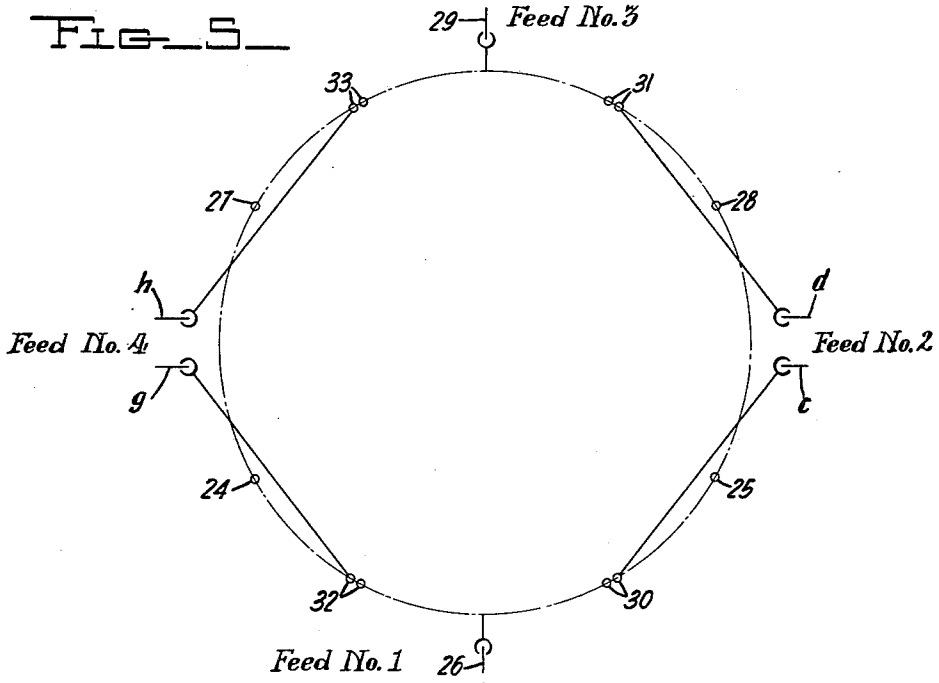
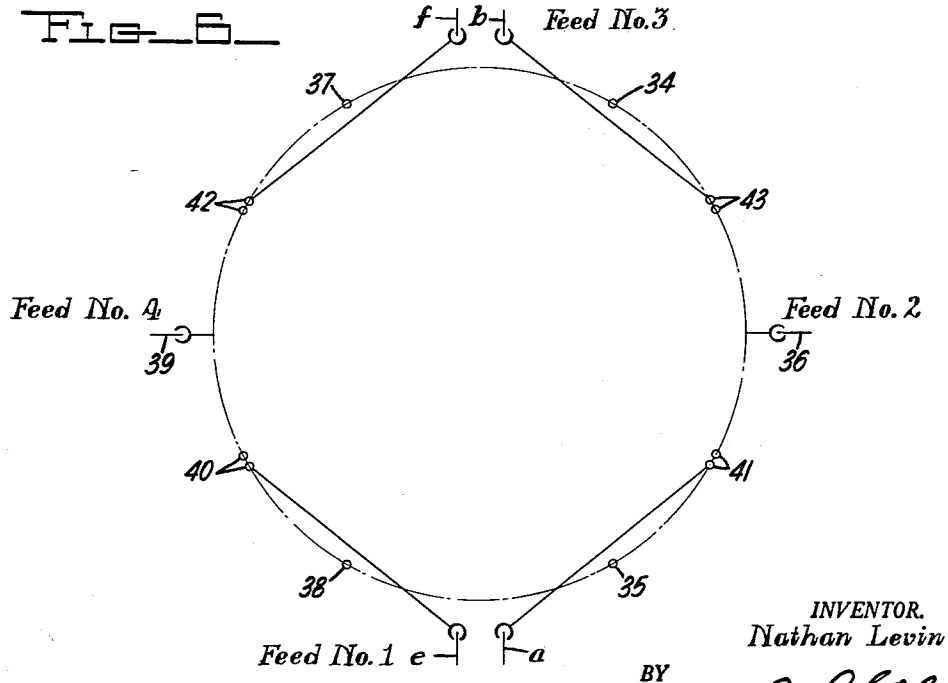


FIG. 6



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Dec. 3, 1963 N. LEVIN 3,112,628

PATTERNED HOSIERY

Original Filed May 15, 1956 4 Sheets-Sheet 4

Fig. 7

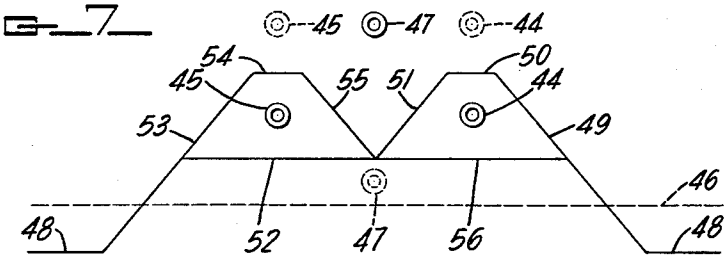


Fig. 8

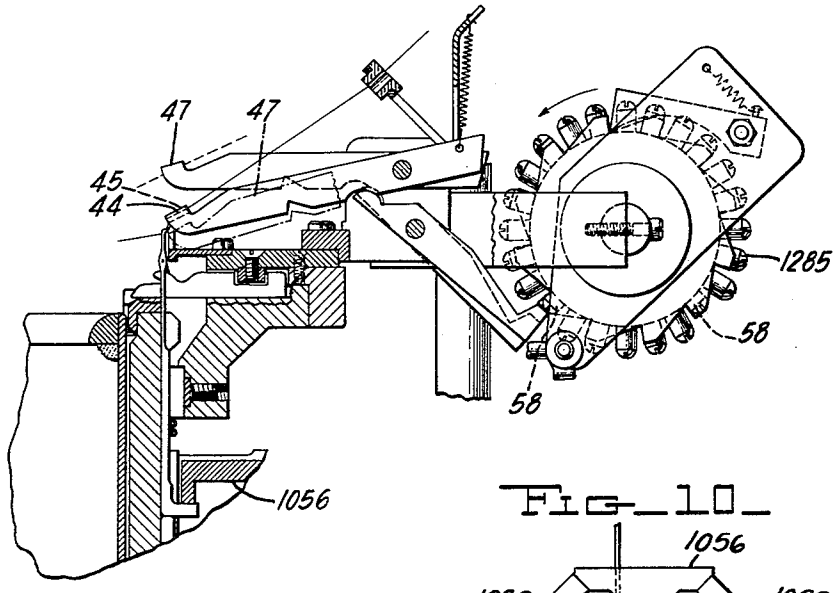


Fig. 9

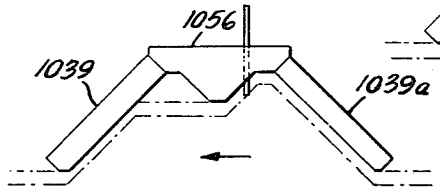
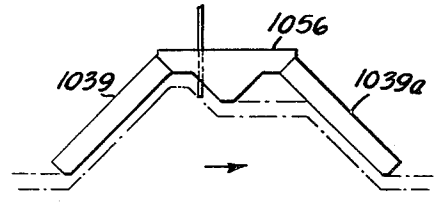


Fig. 10



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United States Patent Office 3,112,628 Patented Dec. 3, 1963

3,112,628

PATTERNED HOSIERY

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Original application May 15, 1956, Ser. No. 584,932, now Patent No. 2,917,912, dated Dec. 22, 1959. Divided and this application Oct. 26, 1959, Ser. No. 848,792
4 Claims. (Cl. 66—179)

The present invention relates generally to the art of knitting and more particularly to a manner and means for incorporating an overplaid design in weft knit fabrics, and to the fabric resulting therefrom. This application is a division of my prior application Serial No. 584,932, filed May 15, 1956, now Patent No. 2,917,912, issued December 22, 1959, for Patterned Hosiery And Method And Apparatus For Making The Same.

It is an object of the present invention to incorporate an overplaid design in tubular weft knit fabric, sometimes known as Argyle or Intarsia fabric, which comprises solid color suture joined sections of separate yarns as made by reciprocating knitting upon a circular knitting machine.

It is also an object of the invention to incorporate an overplaid design as above set forth, upon a multifeed circular knitting machine wherein certain of the feeds are operated to knit certain of the suture joined fabric sections while other feeds are operated to incorporate the overplaid design within the certain fabric sections during the knitting thereof. It will be understood that the term "feed" is used herein in a conventional sense to include the knitting station or mechanism for knitting the yarn fed as well as the yarn feeding means per se.

It is a further object of the invention to incorporate an overplaid design as above set forth upon a four-feed circular machine wherein an opposite pair of feeds is operated to knit a corresponding pair of fabric sections while the remaining pair of feeds is operated to incorporate the overplaid design within the pair of fabric sections during the knitting thereof.

It is also a feature of the invention to provide Argyle or Intarsia knit fabric sections having an overplaid design incorporated therein which includes overplaid yarns knit along lines extending at an angle to the wales and wherein the stitch formation is uniform within each line of the design over a plurality of courses.

With these and other objects in view which will become apparent from the following detailed description of the illustrative embodiment of the invention shown in the accompanying drawings, the invention resides in the novel elements, features of construction and cooperation of parts, as hereinafter more particularly pointed out in the claims.

In the drawings:

FIGURE 1 is a view of one side of a solid color stocking of the Argyle type with an overplaid design incorporated therein;

FIG. 2 is a partial view of the opposite side of the stocking shown in FIGURE 1;

FIG. 3 is an enlarged diagrammatic stitch diagram of a small portion of the fabric enclosed by the dot-and-dash square of FIG. 1;

FIG. 4 is an enlarged diagrammatic stitch diagram similar to FIG. 3 of a small portion of a modified form of fabric;

FIG. 5 is a view illustrating a stage in a method of knitting, according to the invention, upon a four-feed circular machine;

FIG. 6 is a view similar to FIG. 5 illustrating a second stage in the method;

FIG. 7 is a diagrammatic view illustrating the path of needle travel in relation to the yarn guides during rotary and reciprocating knitting at the feeds;

FIG. 8 is a diagrammatic view partially in section taken through the needle cylinder and partially in elevation of the yarn finger control drum, parts being broken away for clearness of illustration, of one feed of a four-feed circular machine and showing the relationship of the needles and the yarn fingers for the incorporation of the overplaid design; and

FIGS. 9 and 10 are views of the needle operating cams as seen from outside the needle cylinder and indicating in dot-and-dash outline the path followed by the needles through the cams during movements in opposite directions.

The overplaid design, of the present inventon is preferably incorporated in circular knit hosiery and is preferably made upon a multifeed machine of the type shown and illustrated in the co-pending application of Benjamin Franklin Coile, Serial No. 329,801, filed January 6, 1953, to which reference may be made as required.

In the machine of the Coile application, hosiery of the Argyle or Intarsia type ornamented with solid color, suture joined, four section pattern areas may be knit by more than one method. One method includes the formation of a complete course, containing suture joined partial courses of each of the four sections, on the four feeds during each stroke of the cylinder. In a second method the machine may be operated to knit an opposite pair of partial courses of an opposite pair of pattern areas on correspondingly opposite feeds, with the other pair of feeds normally inactive, during each stroke of the machine. In this latter method, known as the fill-in system, the opposite pair of pattern areas may be completed, or partially completed, by their associated pair of feeds, after which the said pair of feeds is made inactive and the previously inactive pair of feeds is made active to knit the inbetween pair of pattern areas. For example, in the case of diamond shaped areas of an Argyle pattern, the feeds Nos. 1 and 3 (see FIGS. 5 and 6) may knit an opposite pair of diamonds with feeds Nos. 2 and 4 inactive, after which the feeds Nos. 2 and 4 may be activated to knit and fill-in an inbetween pair of diamonds with feeds Nos. 1 and 3 inactive. It will be understood that the contiguous diamonds are suture joined along their outlines as the held loops thereof on needles retired during the knitting of any one pair of diamonds are knitted through when the retired needles are made active during knitting of the other pair of diamonds. The fill-in system is not limited to the formation of diamond shaped areas but may be used for solid color areas of other formation, depending upon the needle selection setup of the machine.

It is with the fill-in system of solid color knitting that the method of incorporating an overplaid design is herein described, however, it should be understood that the principle of the invention is not so limited and that it is applicable to machines wherein a complete course of fabric is knit during each stroke. For example, the base fabric may contain but a single pair of suture joined areas in which case a complete course may result from the operation of a pair of feeds, or the machine may be provided with overplaid feeding means in addition to the four feeds in which case the four feeds may be used to provide a four section pattern area of which each complete course may be knit during each stroke of the machine.

As illustrated in FIGURE 1, the stocking includes a top **10**, a leg portion **11** and the usual foot portion **12**. The leg portion, see FIGS. 1 and 2, is ornamented by way of example, with a diamond shaped Argyle pattern of which there are the upper opposite pair of side half diamonds **13** and **14**; the intermediate opposite side pair of diamonds **15** and **16**; the lower opposite pair of side half diamonds

17 and 18; the front and rear upper pair of diamonds 19 and 20; and the front and rear lower pair of diamonds 21 and 22. The various diamonds are joined along diagonally extending suture lines 23. The diamonds themselves, each of a solid color, are further ornamented by an overplaid design comprising relatively narrow lines of stitches of contrastingly colored yarn, the overplaid generally dividing each diamond into a group of four smaller diamonds.

The side half diamonds 13 and 17 and the intermediate side diamond 15 are provided with knit overplaid yarns *a* and *b* which start generally at the mid-point of the widest portion of half diamond 13, and, as the knitting continues, diverge to meet the mid-points of suture lines 23 about halfway down the half diamond 13, then float vertically past the rear faces of front and rear diamonds 19 and 20 to the mid-points of the upper suture lines of diamond 15 where they are incorporated along converging and then diverging lines to the mid-points of the lower suture lines of the diamond 15, then again float vertically past the rear faces of the front and rear diamonds 21 and 22 to the mid-points of the upper suture lines of the lower half diamond 17 where they are incorporated along converging lines to meet and terminate generally at mid-point of the widest portion of this half diamond.

In a similar manner the side half diamonds 14 and 18 and the intermediate side diamond 16 are provided with knit overplaid yarns *e* and *f* incorporated therein during the knitting of these diamonds.

The front diamonds 19 and 21 are provided with knit overplaid yarns *d* and *h* which start, respectively at about the mid-point of the suture between the diamond 19 and the half diamond 13 and at about the mid-point of the suture between the diamond 19 and the half diamond 14, then, as the knitting proceeds, converge and diverge within the diamond 19 to the mid-points of its lower suture lines, then float vertically to the mid-points of the upper suture lines of the diamonds 21 where they are incorporated along converging and then diverging lines to terminate at the mid-points of the lower suture lines of the diamond 21.

In a similar manner the rear diamonds 20 and 22 are provided with knit overplaid yarns *c* and *g* incorporated therein during the knitting of these diamonds.

It should be understood that the particular location of the overplaid yarns shown in the drawing is by way of example only and that these may be placed wherever desired in accordance with any design desired by the knitter, the overplaid being incorporated in accordance with the particular needles selected to knit the overplaid yarns.

The arrangement of the feeds Nos. 1 to 4 of the machine is shown in FIG. 5 for the knitting of the front and rear diamonds of body yarn at the feeds Nos. 1 and 3 while the overplaid yarns *c*, *d*, *g*, and *h* are incorporated at the feeds Nos. 2 and 4. In the disposition shown in FIG. 5, a course in the overplaid portion of the diamonds is being knit, the particular course being one that is spaced from the widest part of the diamond. The needles between the points 24 and 25 will be taking and knitting a body yarn 26 at feed No. 1 during each stroke of the needle cylinder, each stroke adding a course to the appropriate diamond, and terminal needles in successive strokes being either added to or retired from this active needle group depending upon whether the diamond courses are then being lengthened or shortened. In like manner the needles between the points 27 and 28 will be taking and knitting a body yarn 29 at feed No. 3.

At this stage of the knitting, overplaid yarn *c* will extend from one side of feed No. 2 to a pair of needles designated at 30 in the 24 to 25 needle group; overplaid yarn *d* will extend from the other side of feed No. 2 to a pair of needles designated at 31 in the 27 to 28 needle group; overplaid yarn *g* will extend from one side of feed No. 4 to a pair of needles designated at 32 in the 24 to 25 needle group; and overplaid yarn *h* will extend from the other side of feed No. 4 to a pair of needles designated at 33 in the 27 to 28 needle group. The pairs of needles 30, 31, 32 and 33 will have knit the overplaid yarns *c*, *d*, *g*, and *h* previously and pairs of needles adjacent thereto will next knit these overplaid yarns.

Assuming the needle circle to be moving in a counterclockwise direction, FIG. 5, which is the forward stroke of the machine (the stroke in each direction being approximately 360 degrees), the needle group 24 to 25 will be knitting body yarn 26 at feed No. 1 to form a rear diamond course while the needle group 27 to 28 will simultaneously be knitting body yarn 29 at feed No. 3 to form a front diamond course. After passing feed No. 1, the needles of group 24 to 25 will be selected as they approach feed No. 2 so that, in this instance, a pair of needles adjacent to needles 30 are raised to take and knit yarn *c* without taking yarn *d*. In a like manner during this forward stroke, after passing feed No. 3, the needles of group 27 to 28 will be selected as they approach feed No. 4 so that, in this instance, a pair of needles adjacent to needles 33 are raised to take and knit yarn *h* without taking yarn *g*.

Then as the needle circle changes direction and moves in clockwise direction, FIG. 5, which is the reverse stroke of the machine, the needle groups 24 to 25 and 27 to 28 will knit at feeds Nos. 1 and 3 similarly to the manner in which they knit on the forward stroke, except that the knitting will be in the opposite direction, and a pair of needles adjacent to needles 32 will be selected to knit yarn *g* at feed No. 4 while missing yarn *h* and a pair of needles adjacent to the needles 31 will be selected to knit yarn *d* at feed No. 2 while missing the yarn *c*.

As above described, for each two strokes of the machine, forward and reverse, two partial courses of front and rear diamonds are formed while a single partial course (two wales wide) is formed of each of the overplaid yarns, there being courses of body yarn knit between the knitting of the overplaid yarns. It will be understood that the number of needles selected to knit the overplaid yarns may vary as required for any particular pattern and may comprise a single needle or more than two needles. The overplaid stitches may be described as extra stitches interposed between adjacent body yarn courses in selected wales as seen in FIG. 4. It will be understood that, from course to course of the diamonds, the number of needles knitting at the feeds Nos. 1 and 3 may be progressively changed and that the particular needles taking the overplaid yarns may vary from course to course so that the overplaid design extends at an angle to the wales as shown and as described in connection with FIGS. 1 and 2. With respect to each of the diamonds, the body yarn is knit during a forward and a reverse stroke while one of the overplaid yarns is knit only during the forward stroke and the other of the overplaid yarns is knit only during the reverse stroke.

In the above described method of knitting on groups of needles represented by needle groups 24 to 25 and 27 to 28, no variation in the knitting there of at feeds Nos. 1 and 3 has been set forth so that complete partial courses of consecutive loops in each of the consecutive wales would result, with extra stitches of the overplaid yarns knit at feeds Nos. 2 and 4 interposed at selected wales between the courses as in FIG. 4. The machine may be also operated so that selected needles in each of the courses be actuated to remain at the low idle level so as not to knit at times at the feeds Nos. 1 and 3 thereby to provide floats of the body yarns at least in those wales and courses in which the overplaid yarns are knit, with the result that the body yarns float to the rear of the overplaid stitches. This will be set forth in more detail in connection with the description of the stitch diagram of the fabric shown in FIG. 3.

For the knitting of the side half and full diamonds,

the arrangement of feeds Nos. 1 to 4 is shown in FIG. 6, the necessary changes being made automatically when each of these diamonds are to be made. The side diamonds are knit of body yarn at feeds Nos. 2 and 4 while the overplaid yarns *a*, *b*, *e*, and *f* are incorporated at feeds Nos. 1 and 3. In the disposition of FIG. 6, a course in the overplaid portion of the diamonds is being knit, the particular course being one that is spaced from the widest part of the diamond. The needles between the points **34** and **35** will be taking and knitting a body yarn **36** at feed No. 2 during each stroke of the needle cylinder, each stroke adding a course to the appropriate diamond, and terminal needles in successive strokes being either added to or retired from this active needle group depending upon whether the diamond courses are then being lengthened or shortened. In like manner the needles between the points **37** and **38** will be taking and knitting a body yarn **39** at feed No. 4.

At this stage of the knitting, overplaid yarn *e* will extend from one side of feed No. 1 to a pair of needles designated at **40** in the **37** to **38** needle group; overplaid yarn *a* will extend from the other side of feed No. 1 to a pair of needles designated at **41** in the **34** to **35** needle group; overplaid yarn *f* will extend from one side of feed No. 3 to a pair of needles designated at **42** in the **37** to **38** needle group; and overplaid yarn *b* will extend from the other side of feed No. 3 to a pair of needles designated at **43** in **34** to **35** needle group. The pairs of needles **40**, **41**, **42** and **43** will have knit the overplaid yarns *e*, *a*, *f*, and *b* previously and pairs of needles adjacent thereto will next knit the overplaid yarns.

The action is similar to that described in connection with FIG. 5 except as to the particular diamonds being made, the needle group **34** to **35** will be knitting body yarn **36** at feed No. 2 to form courses of side diamonds **13**, **15** and **17**, while the needle group **37** to **38** will simultaneously be knitting body yarn **39** at feed No. 4 to form courses of the opposite side diamonds **14**, **16** and **18**. As the needle circle moves in a forward stroke, after passing feed No. 2, the needles of group **34** to **35** will be selected as they approach feed No. 3 so that, in this instance, a pair of needles adjacent needles **43** are raised to take and to knit yarn *b* without taking yarn *f*. In a like manner during this forward stroke, after passing feed No. 4, the needles of group **37** to **38** will be selected as they approach feed No. 1 so that, in this instance, a pair of needles adjacent to needles **40** are raised to take and to knit yarn *e* without taking yarn *a*.

Then as the needle circle changes direction and moves on its reverse stroke, the needle groups **34** to **35** and **37** to **38** will knit at feeds Nos. 2 and 4 similarly to the manner in which they knit on the forward stroke, except that the knitting will be in the opposite direction, and a pair of needles adjacent to needles **41** will be selected to knit yarn *a* at feed No. 1 while missing yarn *e* and a pair of needles adjacent needles **42** will be selected to knit yarn *f* at feed No. 3 while missing yarn *b*.

It will be understood, as the needle circle makes its forward and its reverse strokes, that the various yarns mentioned will be extending from their yarn guides to the final loops previously knit of each of the yarns, some of the yarn then extending from inactive yarn guides to the fabric while the active yarns extend from their guides to loops on the needles. The yarns will change their relative dispositions as the knitting continues and as the cylinder reciprocates so that it may appear that the yarns are being twisted and will interfere with each other. However, the yarns continue to twist and to untwist without such interference. No showing has been made in FIGS. 5 and 6 of the inactive yarns then attached to the fabric, nor has any attempt been made to show the various changing positions of the floats of the six yarns being knit since this is not essential to an understanding of the invention by those skilled in the art.

It should be noted in FIGS. 5 and 6 that the overplaid yarns are circumferentially spaced at each of the feeds and this, in conjunction with a higher feeding level for the overplaid yarns and a special path of travel for the needles, causes the selected needles to take one only of the overplaid yarns when moving in one direction and to take only the other of the overplaid yarns when moving in the opposite direction. FIG. 7 shows the relative disposition of the body and overplaid yarn guides, the low inactive level of the needles, the throat plate level, and the separate paths of travel for the needles, to enable the herein described method of knitting to be carried out. It is illustrative of the action of each of the feeds Nos. 1 to 4 when used to feed body yarn and when used to feed overplaid yarn. A pair of yarn guide ends **44** and **45** are shown as representative of the means for feeding a pair of overplaid yarns at each of the feeds and these are shown circumferentially spaced as well as being disposed somewhat above the normal throat plate level shown at **46** when in their active feeding positions indicated by full lines. The inactive positions of the guide ends are shown in dotted lines. The dotted line showing of a yarn guide end at **47** represents the active position of the body yarn feeding means relative to the active positions of the overplaid yarn guides and to the throat plate level. It will be understood that the overplaid and the body yarns are not in active feeding positions at the same time and hence the body yarn guide is shown in full lines in its inactive position. The needle path is such that selected needles move from low idle level **48** upwardly across throat plate level **46**, as they move from right to left in FIGURE 7, along path **49** to upper level **50** where they have cleared latches, thence downwardly along path **51** to intermediate level **52** and thence downwardly again to the idle level **48**. This path is such that needles will take a yarn from the guide indicated at **44** and will not take yarn from the guide indicated at **45**. Similarly the needle path is such that, as the needles move from left to right, they move from low idle level **48** upwardly across throat plate level **46**, thence along path **53** to upper level **54** where they have cleared latches, thence downwardly along path **55** to intermediate level **56** and thence downwardly again to the idle level **48**. This path is such that needles will take a yarn from the guide indicated at **45** and will not take yarn from the guide indicated at **44**. The needle means for operating the needles includes a lowering or center cam **1056** and stitch cams **1039** and **1039***a* (FIGS. 8, 9 and 10) as provided in the machine of the Coile application the cams being appropriately shaped to provide the needle paths **51** and **55** shown in FIG. 7. Also in the machine of the Coile application, a portion of the yarn guide control means of this machine being illustrated in FIG. 8, as one means of accomplishing the result, selected ones of the studs **1285** on the yarn finger control drum at each of the feeds may be made of lesser height, as illustrated at **58**, to position the spaced end yarn guides which are to feed the overlay yarns so that their feeding ends are disposed as shown in FIG. 7. It may be desirable to have these overlay yarn guides spaced further apart than the end yarn guides are shown on the machine of the application and this may be readily accomplished in any desirable manner.

It will be understood that when body yarn guide **47** is in feeding position, with guides **44** and **45** elevated to inactive positions, that the needle path is such that the body yarns may be taken and knit by the needles in both directions of knitting.

In the formation of the fabric illustrated by FIG. 3, as the knitting is carried out on a stroke of the machine in one direction, say as shown in FIG. 5 as indicated by the arrow in FIG. 9, the body yarn **26** is knit from right to left to form course **57** of the fabric or left to right when the fabric is viewed as it is formed on the machine, as the needles pass through the needle operating cams at

feed No. 1. When the needles of wales **58** and **59** come to feed No. 4 and are selected to knit thereat, they will knit stitches **60** and **61**, in that order, at the feed No. 4 of the overplaid yarn *g*, these being the only needles then knitting at feed No. 4 on this stroke in the one direction. Then as the needles pass through the operating cams in the next stroke of the machine in the opposite direction as indicated by the arrow in FIG. 10 the body yarn **26** is knit from left to right to form course **62** of the fabric as viewed in FIG. 3 or from right to left when the fabric is viewed as it is formed on the machine and as this course is made at feed No. 1, the needles of wales **63**, **64**, **59**, and **58** will remain at low idle level holding the loops then thereon (these will be body yarn loops on the needles of wales **63**, **64** and the stitches **61**, **60** of overplaid yarn *g* on the needles of wales **59**, **58**) so that the floats **65** and **66** will be made. When the needles of wales **63** and **64** come to feed No. 2 and are selected to knit thereat, they will knit stitches **67** and **68**, in that order, at the feed No. 2 of the overplaid yarn *c*, these being the only needles then knitting at feed No. 2 on this stroke in the opposite direction.

As the next stroke of the machine in the one direction is made, the body yarn **26** is knit from right to left (left to right as the fabric is formed on the machine) to form course **69** of the fabric and as this course is made at feed No. 1, the needles of wales **58**, **59**, **63** and **64** will remain at low idle level holding the loops then thereon (these will be stitches **60**, **61** of overplaid yarn *g* and stitches **67**, **68** of overplaid yarn *c*) so that floats **70** and **71** will be made. When the needles of wales **72** and **73** come to feed No. 4 and are selected to knit thereat, they will knit stitches **74** and **75**, in that order, at the feed No. 4 of the overplaid yarn *g*, these being the only needles then knitting at feed No. 4 on this stroke in the one direction. Then as the next stroke of the machine in the opposite direction is made the body yarn **26** is knit from left to right (right to left as the fabric is formed on the machine) to form course **76** of the fabric and as this course is made at feed No. 1, body yarn stitches will be knit through overplaid stitches **60**, **61** and **67**, **68**, and the needles of wales **72**, **73**, **77** and **78** will remain at low idle level holding the loops then thereon (these will be body yarn loops on the needles of wales **77**, **78** and will be the stitches **74**, **75** of overplaid yarn *g* on the needles of wales **72**, **73**) so that the floats **79** and **80** will be made. When the needles of wales **77**, **78** come to feed No. 2 and are selected to knit thereat, they will knit stitches **81** and **82**, in that order, at feed No. 2 of overplaid yarn *c*, these being the only needles then knitting at feed No. 2 on this stroke in the opposite direction.

As the next stroke of the machine in the first direction is made, the body yarn **26** is knit from right to left to form course **83** of the fabric and as this course is made at feed No. 1, the needles of wales **72**, **73**, **77** and **78** will remain at low idle level holding the loops then thereon (these being stitches **74**, **75**, **81** and **82**) so that floats **84** and **85** will be made.

The next course is **86**, formed on a stroke in the opposite direction at feed No. 1 similar to the other strokes in this direction and in which the body yarn **26** is knit through stitches **74**, **75**, **81** and **82** of the overplaid yarns, and the float **87** is formed, while the stitches **88** and **89** are knit of overplaid yarn *c* at feed No. 2 on the same opposite stroke.

The above described knitting action and fabric in connection with the stitch diagram of FIG. 3 will illustrate that for each pair of consecutive courses of body yarns there are stitches (here shown in adjacent wales and comprising pairs) of the overplaid yarns which extend walewise over said pair of courses and that while each course of a pair of the adjacent pairs of courses is knit in opposite directions, each of the overplaid yarns is always knit in the same direction, although the direction in which yarn *g* is knit is opposite to that in which yarn *c* is knit.

Accordingly the stitch formation of each unit of the overplaid yarn incorporated into the fabric is always the same with the result that the overplaid design is uniform in character. It will be noted that the yarn *g* and the yarn *c* in passing from the last stitch thereof in one course to the first stitch thereof in the next course, as indicated at **90**, does not take a reverse path but always continues to move in the same direction. Whenever overplaid stitches are arranged at an angle to the wales as shown in the courses **57**, **62**, **69**, **76**, **83** and **86**, their relation to the base fabric will be similar to that shown and described in connection with FIG. 3.

The remaining courses **91** through **96** are made in a manner similar to the manner of making the previously described courses of FIG. 3 with the exception that the float path of yarns *c* and *g*, at the rear of the fabric, as they travel from the last stitch knit in one course to the first stitch to be knit in a following course is such that it extends over a number of wales in a direction opposite to the direction in which these overplaid stitches are knit, as indicated at **97**. The reason for the longer floats **97** as compared to the shorter floats **90** is that when the angle of the overplaid design, relative to the wales, is such that it moves in the direction of the knitting in the successive courses, as in the courses **57**, **62**, **69**, **76**, **83** and **86**, then there are short floats **90**, but when it moves in the opposite direction as in the courses **91** through **96**, there are the longer floats **97**.

A modified form of fabric previously referred to is illustrated in FIG. 4 as resulting from the operation of the machine and method herein described in which no floats are formed in the body fabric at any of the body knitting feeds. The course **98** may be knit upon feed No. 1 of body yarn **26** during a stroke in one direction, the knitting being from right to left (left to right as the fabric is formed on the machine), and, during the same stroke the needles of wales **99** and **100** will knit stitches **101** and **102**, in that order, of overplaid yarn *g*. The next is a stroke in the opposite direction to form course **103** which is knit from left to right (right to left as the fabric is formed on the machine) and this course, for so much of the fabric as is shown, comprises a stitch of body yarn **26** in every wale. It will be understood that overplaid yarn *c* may be incorporated in other portions of the fabric in a manner similar to the manner of incorporating the yarn *g*. The courses **104** and **105** are then formed similarly to the formation of courses **98** and **103**, and it will be noted that the extra stitches of the yarn *g*, included between adjacent courses, are each separated walewise by a pair of intervening courses. The overplaid yarn stitches may be drawn longer than the body yarn stitches, in the fabrics of FIGS. 3 and 4, if so desired. In the fabric of FIG. 3, the holding of the overplaid stitches on their needles during the body yarn float formation courses, will tend to lengthen the same.

It will be understood that the overplaid stitches may be in single wales or may extend over any desired number thereof and that they do not necessarily have to step over in the successive courses but may continue in the same wale or wales for a number of courses or for the entire height of the patterned area if desired. While the body yarn floats have been shown in FIG. 3 as extending over two wales for two courses directly beneath the overplaid stitches for best results, it should be understood that their length, and number thereof, and their relation to the overplaid stitches may be varied to some extent within the principle of the invention.

I claim:

1. A tubular fabric having a plurality of suture joined fabric areas of which at least one of said areas comprises fabric the courses of which are made of a body yarn knit in opposite directions and wherein said area is ornamented with an overplaid design comprising stitches of an overplaid yarn incorporated in said courses in only one

of said directions, said overplaid stitches extending over at least a pair of adjacent courses of said body yarn.

2. A tubular fabric having a plurality of suture joined fabric areas of which at least one of said areas comprises fabric the courses of which are made of series of stitches of a body yarn knit in opposite directions and wherein said area is ornamented with an overplaid yarn comprising stitches of an overplaid yarn incorporated in said courses in only one of said directions, said overplaid stitches being between stitches of said body yarn and extending over at least a pair of adjacent courses of said body yarn, said body yarn floating rearwardly of said overplaid stitches in said adjacent courses.

3. A tubular fabric having a plurality of suture joined fabric areas of which at least one of said areas comprises fabric the courses of which are made of a body yarn knit in opposite directions and wherein said area is ornamented with an overplaid design comprising stitches of an overplaid yarn incorporated in said courses in only one of said directions, said overplaid stitches extending over at least a pair of adjacent courses of said body yarn and said overplaid stitches in the pairs of adjacent courses extending along diagonal lines.

4. A tubular fabric having a plurality of suture joined fabric areas of which at least one of said areas comprises fabric the courses of which are made of a body yarn knit in opposite directions and wherein said area is ornamented with an overplaid design comprising a plurality of stitches of an overplaid yarn incorporated in said courses in only one of said directions, said overplaid stitches each extending over at least a pair of adjacent courses of said body yarn and said overplaid stitches in the pairs of adjacent courses extending along diagonal lines, and said overplaid yarn extending from the last of said overplaid stitches in one of said pair of courses to the first of said overplaid stitches in an adjacent pair of courses.

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