Oct. 10, 1961 U. ALFANO 3,003,343

KNIT SIMULATED LACE

Filed Feb. 17, 1958 2 Sheets-Sheet 1

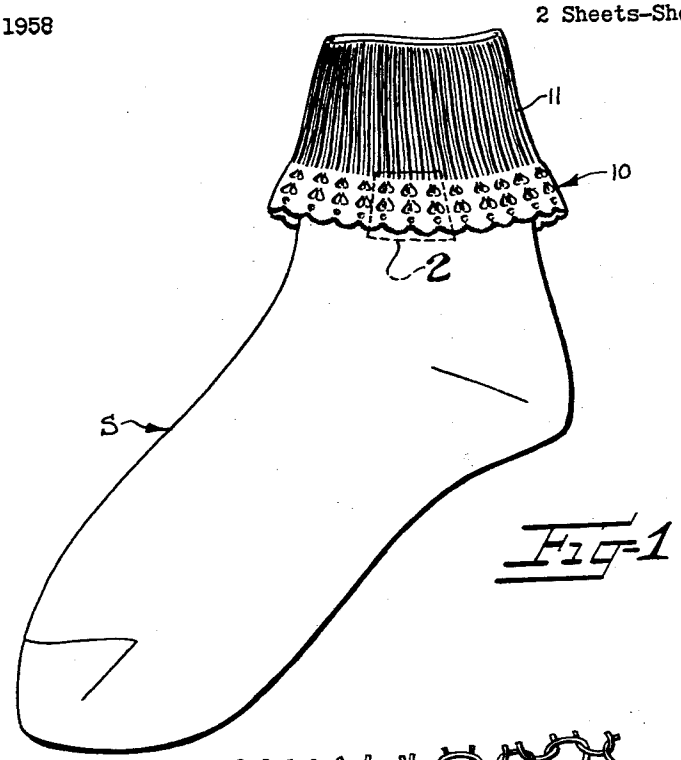


Fig-1

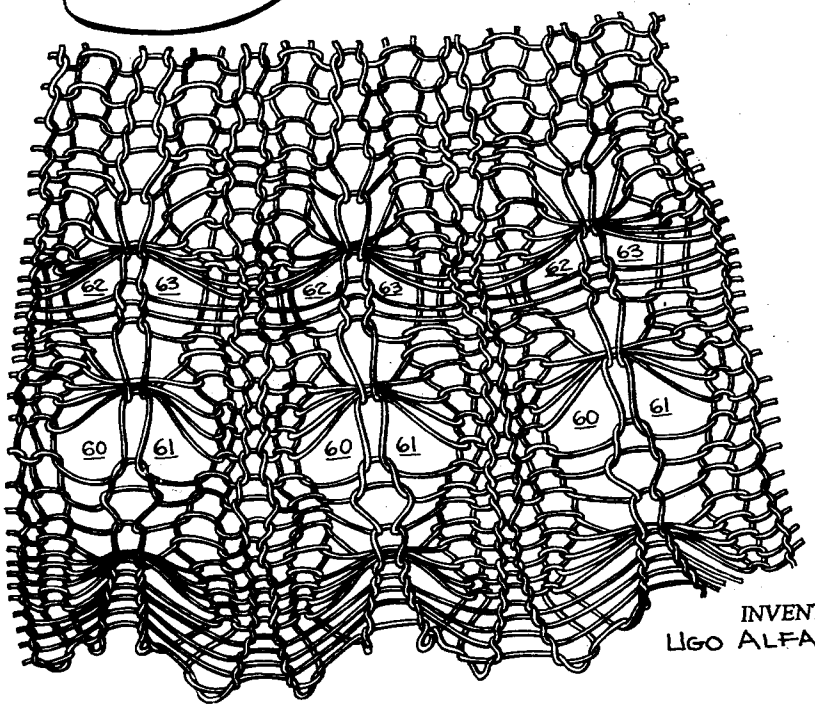


Fig-2

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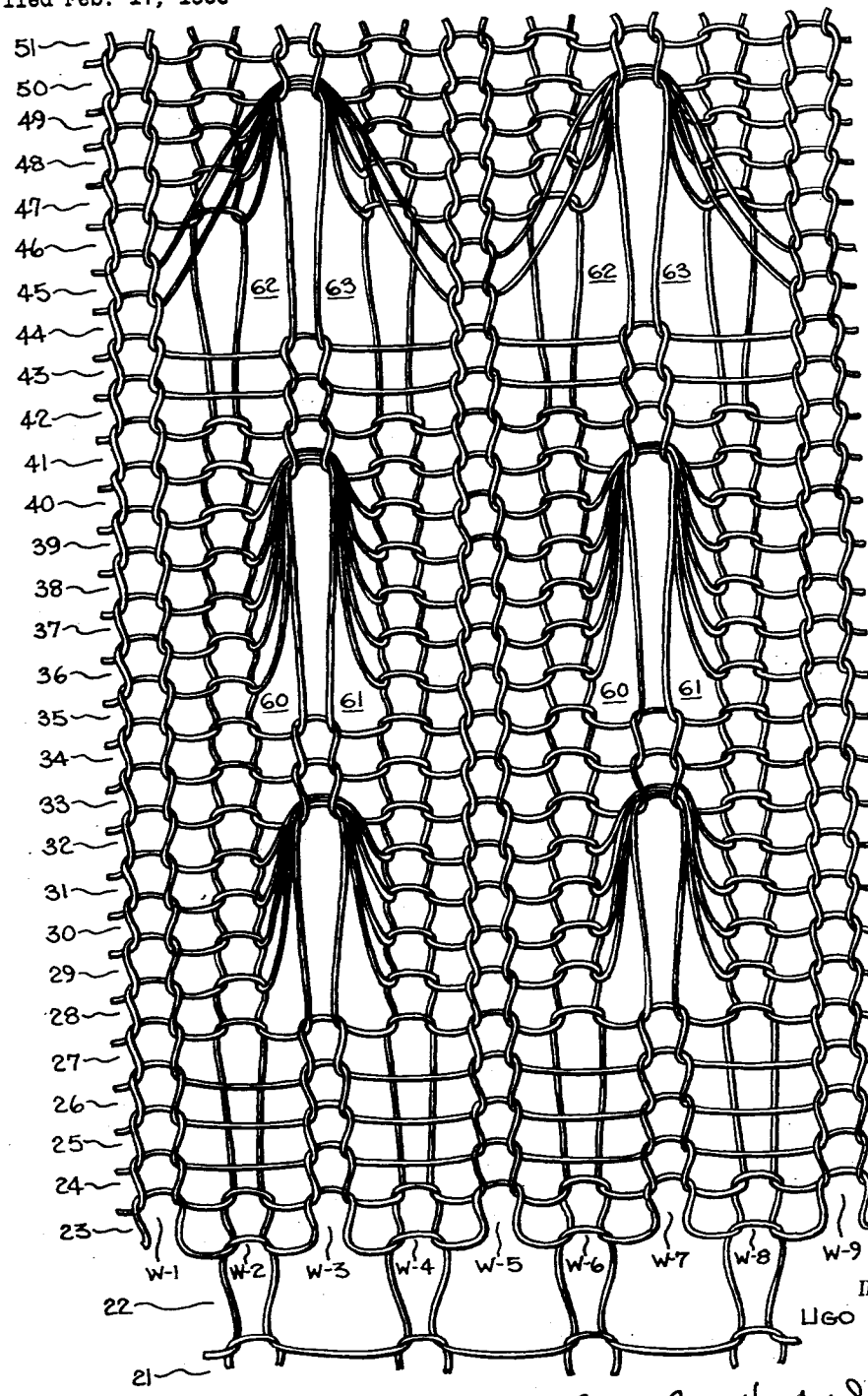


Fig-3

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United States Patent Office 3,003,343 Patented Oct. 10, 1961

3,003,343

KNIT SIMULATED LACE

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Filed Feb. 17, 1958, Ser. No. 715,742
6 Claims. (Cl. 66—172)

This invention relates generally to a simulated knit lace fabric and more particularly to a simulated lace which is knit on a circular independent needle knitting machine and forms an ornamented edge or top of the cuff of a stocking. The simulated lace of the present invention is produced in a single continuous operation on the same machine as the cuff of the knitted stocking and therefore does not require two separate operations. This simulated lace edge is of particular importance in the manufacture of infant and baby socks where an ornamented edge or top is very desirable.

Heretofore, most infant socks have been knit with a true-rib knit cuff attached to a plain knit foot and a lace border or edge sewed or otherwise attached to the edge of the cuff. The lace border is manufactured on a special machine and must be attached to the knit cuff of the sock by a special operation, which necessarily increases the cost of producing infant socks.

With the foregoing in mind, it is the primary object of this invention to provide a simulated lace fabric which may be knit on the same machine that the knitted cuff is knitted on so that the simulated lace fabric and the usual knitted cuff are formed and joined together in a single continuous operation.

It is another object of this invention to provide a simulated lace fabric which is knit on a circular knitting machine also capable of knitting a plain or rib knit cuff integral with the lace fabric to thereby materially reduce the usual cost of manufacture of this type fabric. The production of this fabric on a single machine in a continuous operation thus does away with the cost of special machines to produce the lace and the cost of having the lace sewed onto the sock.

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—

FIGURE 1 is a side elevation of a stocking provided with a knitted simulated lace edge produced in accordance with this invention;

FIGURE 2 is a greatly enlarged fragmentary elevation of the area indicated by the dotted rectangle **2** in FIGURE 1 and showing the arrangement of the stitches in the finished product;

FIGURE 3 is a greatly enlarged diagrammatic view illustrating the manner in which the stitches of the simulated lace fabric shown in the left-hand two-thirds of FIGURE 2 are formed.

Referring to the drawings, the knitted simulated lace border is indicated broadly at **10** and is shown joined in integral knit relation to a knit cuff portion **11** at the top of a sock S in FIGURE 1. The fabric of the present invention may be produced on one of many different types of knitting machines currently available and is illustrated as true-rib knit fabric produced on the well known type machine having dial and cylinder needles.

Referring to FIGURE 3, the first courses **21** and **22** of knitting form stitch loops in the wales W–2, W–4, W–6 and W–8. These courses are commonly called separating courses and are provided to temporarily hold the knitted fabric sections together when knitted as string work. Of course, after knitting is completed and the fabric is removed from the machine, the courses **21** and **22** are unraveled or otherwise removed between the sections held together thereby.

The course **23** in FIGURE 3 is the first course of the simulated lace portion **10** and is knitted in alternate wales, indicated at W–1, W–3, W–5, W–7 and W–9, by the cylinder needles and in intervening wales, indicated at W–2, W–4, W–6 and W–8, by the dial needles to form the make-up course. In the next course indicated at **24**, the yarn is fed to the cylinder and dial needles in wales W–1 through W–9 and stitch loops are drawn by both the cylinder and dial needles to shed the previously formed loops of course **23**. In the course **24**, the dial needles in wales W–2, W–4, W–6 and W–8 are extended to take the yarn in the hooks thereof and withdrawn sufficiently to form stitch loops and thus shed the stitch loops in wales W–2, W–4, W–6 and W–8 of course **23** but are not again extended to yarn receiving position after shedding these loops.

In course **25**, the cylinder needles in wales W–1, W–3, W–5, W–7 and W–9 only take the yarn and form stitches therewith since the dial needles in wales W–2, W–4, W–6 and W–8 remain in withdrawn position so that the yarn is floated across the wales W–2, W–4, W–6 and W–8. Courses **26** and **27** are then successively knitted in an identical manner to that described for course **25** that is, with the cylinder needles in wales W–1, W–3, W–5, W–7 and W–9 drawing stitches and the dial needles in wales W–2, W–4, W–6 and W–8 continuing to hold in their hooks the stitch loops formed in the course **24**. Of course, the number of courses knitted in this manner may vary from the number described if desired.

Course **28** is next formed by feeding yarn to the dial and cylinder needles in all the wales W–1 through W–9 and drawing stitch loops therewith in all of the wales. The stitch loops drawn in wales W–2, W–4, W–6 and W–8 during the knitting of course **28** thus cause the dial needles to shed the previously held yarn fed thereto during the course **24** to form hold or draw stitches extending from the course **24** to the course **28**. Course **29** is next formed by feeding yarn to the hooks of the needles in all wales W–1 through W–9 but the cylinder needles in wales W–3 and W–7 are not previously raised to stitch shedding level so that the yarn fed thereto is held in the hook along with the yarn of the stitch loop formed in course **28**. Courses **30**, **31** and **32** are next formed in a manner identical to that which the course **29** was formed and here again the number of courses formed in this manner may vary if desired.

Course **33** is then formed by feeding the yarn to all the cylinder and dial needles after raising all the needles to shedding level to draw stitch loops in each wale of this course. Thus, when the stitch loops are formed in wales W–3 and W–7 of course **33** a tuck stitch is formed in each wale which covers the area from course **28** through course **32**. These tuck stitches include the yarns fed to the cylinder needles during courses **28**, **29**, **30**, **31** and **32**. The tuck stitches in the wales W–3 and W–7 of FIGURE 3 are exaggerated in length but appear about normal in size in FIGURE 2. The drawing up of the fabric by the tuck stitches and hold stitches in courses **23** through **32** provides a picot or scalloped edge on the fabric, best illustrated in FIGURES 1 and 2. While the picot or scalloped edge of the fabric in FIGURES 1 and 2 appears to be flat the edge actually forms a wavy line parts of which are closer to the observer than others, when looking at the fabric as illustrated in FIGURE 2.

Following the course **33**, another plain rib knit course, indicated at **34** in FIGURE 3, is knit on all of the dial and cylinder needles by feeding a yarn to all of the needles and drawing stitches therewith in each of the wales W–1 through W–9. The simulated lace fabric is then begun in the course **35** by feeding yarn to all the

needles and knitting stitch loops with the needles in all wales. The course **36** is next formed by feeding yarn to the hooks of the needles in all wales W–**1** through W–**9** but the cylinder needles in wales W–**3** and W–**7** are not previously raised to stitch shedding level so that the yarn fed thereto is held in the hook along with the yarn of the stitch loop formed in course **35**. The courses **37** through **40** are formed in the same manner as the course **35** with an additional yarn being fed to the hooks of the cylinder needles in wales W–**3** and W–**7** with each revolution of the cylinder.

The course **41** is next knit by feeding yarn to all of the needles, after raising the needles in wales W–**3** and W–**7** to shedding level, and stitch loops are drawn by the needles in each of the wales W–**1** through W–**9** to thus form tuck stitches in the wales W–**3** and W–**7** which extend from the course **35** through the course **40**. The manner in which the tuck stitches are formed in the courses **35** through **40** and wales W–**3** and W–**7** causes the adjacent stitches to be distorted in the manner indicated in FIGURE 2 to provide openings indicated at **60** and **61** adjacent opposite sides of each of the tuck stitches around the periphery of the sock S. The openings **60** and **61** simulate the openings formed in true lace which must ordinarily be produced on a conventional lace machine.

In the courses **42** through **49**, a simulated lace fabric is formed which has a different appearance than the simulated lace fabric formed in the courses **35** through **41**. This is effected by combining tuck stitches and hold or draw stitches. In forming this area, a course **42** is first knitted by feeding yarn to all of the needles and drawing stitches therewith but are held in withdrawn position until a subsequent course. Thus, when the next course **43** is formed, the cylinder needles in wales W–**1**, W–**3**, W–**5**, W–**7** and W–**9** take and draw stitches with the yarn but the dial needles in wales W–**2**, W–**4**, W–**6** and W–**8** are in withdrawn position and holding the stitches in course **42** so that the yarn is floated across these wales. The course **44** is knitted in a manner identical to the course **43** except that the cylinder needles in wales W–**3** and W–**7** are not raised to shedding level before the next course.

The course **45** is next formed by feeding yarn to the cylinder needles in wales W–**1**, W–**3**, W–**5**, W–**7** and W–**9** and drawing stitch loops with the cylinder needles in wales W–**1**, W–**5** and W–**9** only. Thus, during course **45**, the cylinder needles in the wales W–**3** and W–**7** take the yarn in the hooks thereof but do not form stitches therewith until a subsequent course while the yarn is floated across the dial needle wales W–**2**, W–**4**, W–**6** and W–**8**. The next course **46** is formed in a manner identical to course **45**.

Course **47** is formed by feeding yarn to the hooks of all of the needles and drawing stitches therewith in all of the wales except the wales W–**3** and W–**7** so that the hold or draw stitches in the wales W–**2**, W–**4**, W–**6** and W–**8** are shed off of the dial needles which held them in the hooks thereof since the course **42**. The courses **48** and **49** are knit in an identical manner to the course **47** with the cylinder needles in wales W–**3** and W–**7** receiving yarn in the hooks but not forming form stitches therewith.

The course **50** is next formed by feeding yarn to all of the needles in the wales W–**1** through W–**9** and drawing stitch loops therewith in each wale after raising the cylinder needles in wales W–**3** and W–**7** to shedding level. Upon the stitch loops in wales W–**3** and W–**7** being formed in the course **50**, tuck stitches are formed in these wales W–**3** and W–**7** and extend from the course **44** through the course **49**. The course **51** and succeeding courses are formed with plain or regular stitches in each wale and are illustrated as being alternately knit on cylinder and dial needles to provide forwardly and reversely facing stitch loops.

Referring to FIGURE 3, it will be noted that some of the yarns gathered by the tuck stitches extend from

stitches in adjacent wales and others extend from wales disposed one wale away from the tuck stitches to thus produce openings indicated at **62** and **63** on opposite sides of the tuck stitches. The appearance of the openings **62** and **63** are different from the appearance of the openings **60** and **61** immediately therebelow because of the manner in which the tuck stitches are formed in combination with the hold or draw stitches.

The tuck and draw stitches distort the plain stitches in the courses **24** through **33** to form the picot or scalloped edge of the simulated lace portion **10** after the separating courses **21** and **22** are removed, as best shown in FIGURE 2. The courses **34** through **41** of the simulated lace having the openings **60** and **61** therein are produced by forming tuck stitches in wales W–**3** and W–**7**. The courses **42** through **50** having the openings **62** and **63** therein are produced by forming hold or draw stitches in wales W–**2**, W–**4**, W–**6** and W–**8** and forming tuck stitches in the wales W–**3** and W–**7**.

Thus, a simulated lace fabric has been provided which may be knit continuously on a circular knitting machine and having a conventionally knit cuff knitted integral therewith in a continuous operation without the necessity of knitting the lace on a separate machine and then sewing or otherwise attaching the same to a conventionally knit cuff for a stocking or the like. It is to be understood that although the cylinder needles in wales W–**3** and W–**7** are used to form the tuck stitches in each instance, other needles may be utilized to form tuck stitches in other portions of the simulated lace fabric.

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. An ornamental top for a circular knit stocking having an integrally knit scalloped terminal edge and a simulated lace portion, said top comprising the combination of a plurality of successively knit courses forming walewise stitch loops, first draw stitches formed in every recurrent second wale in a first group of knit courses, first tuck stitches formed in every recurrent fourth wale in a second group of courses immediately following said first group of courses, said first draw stitches and tuck stitches deforming the fabric to provide the scalloped edge therealong, plain stitches formed in all wales in a series of courses immediately following said first tuck stitch courses, second tuck stitches formed in said fourth wales in a third group of courses immediately following said series of courses, plain stitches formed in all wales of a course immediately following said second tuck stitch courses, second draw stitches formed in said second wales in a fourth group of courses immediately following said regular stitch course, third tuck stitches formed in said fourth wales in the last three courses of said fourth group of courses and extending into a fifth group of courses, and plain stitches formed in all wales in a second series of courses immediately following said third tuck stitch courses, the second tuck stitches in the third group of courses and the third tuck stitches and second draw stitches in the respective fourth and fifth groups of courses deforming the fabric to form openings adjacent opposite sides of the tuck stitches simulating the openings in lace.

2. A circular knit fabric top for a stocking comprising a plurality of successively knit courses forming walewise stitch loops, draw stitches formed in spaced apart wales in a first group of said courses to draw up the fabric in said wales, and tuck stitches formed in other wales in a second group of courses successively following said first group of courses to further draw up the fabric, and plain stitches formed in all other wales in each group of courses, the drawing up of the fabric by the draw and tuck stitches forming a scalloped edge on the fabric.

3. A circular knit simulated lace fabric comprising successively knit courses forming walewise stitch loops, draw stitches formed in selected wales in a certain group of courses, and tuck stitches formed in wales other than said selected wales, said tuck stitches being formed in some of the courses of said certain group of courses and extending into another group of courses immediately following said certain group of courses, the draw stitches and tuck stitches deforming the fabric to form openings adjacent opposite sides of the tuck stitches which simulate the openings in lace.

4. A circular knit simulated lace fabric comprising successively knit courses forming walewise stitch loops, first tuck stitches formed in selected wales in a given group of courses, at least one course of plain stitches immediately following said given group of courses, draw stitches formed in selected wales other than the wales in which said first tuck stitches are formed and in a certain group of courses immediately following the course of plain stitches, and second tuck stitches formed in the same wales as said first tuck stitches, said second tuck stitches being formed in some of the courses of said certain group of courses and extending into another group of courses immediately following said certain group of courses, the draw and tuck stitches deforming the fabric to form openings having different appearances adjacent opposite sides of the first and second tuck stitches to simulate the irregular openings in lace.

5. A circular knit fabric top for a stocking comprising a plurality of successively knit courses forming walewise stitch loops, draw stitches formed in spaced apart wales in a first group of said courses to draw up the fabric in said wales, tuck stitches formed in other wales in a second group of courses immediately following said first group of courses to further draw up the fabric, plain stitches formed in all other wales in each group of courses, the drawing up of the fabric by the draw and tuck stitches forming a scalloped edge on the fabric, plain stitches formed in all wales in a series of courses immediately following said second group of courses, and second tuck stitches formed in said other wales in a third group of courses immediately following said series of courses, the second tuck stitches in the third group of courses deforming the fabric to form openings adjacent opposite sides of the tuck stitches simulating the openings in lace.

6. A circular knit fabric top for a stocking comprising a plurality of successively knit courses forming walewise stitch loops, tuck stitches formed in spaced apart wales in a certain group of courses to draw up the fabric in said wales, draw stitches formed in other wales in a second group of courses successively following said certain group of courses to further draw up the fabric, and plain stitches formed in all other wales in each group of courses, the tuck and draw stitches deforming the fabric to form openings which simulate the openings in lace.

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