

- [54] STOCKING WITH TWO PLY TOE
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 [51] Int. Cl. D04b 9/54, D04b 9/56
 [58] Field of Search..... 66/187, 198, 185, 66/186, 169 A, 172 R, 173

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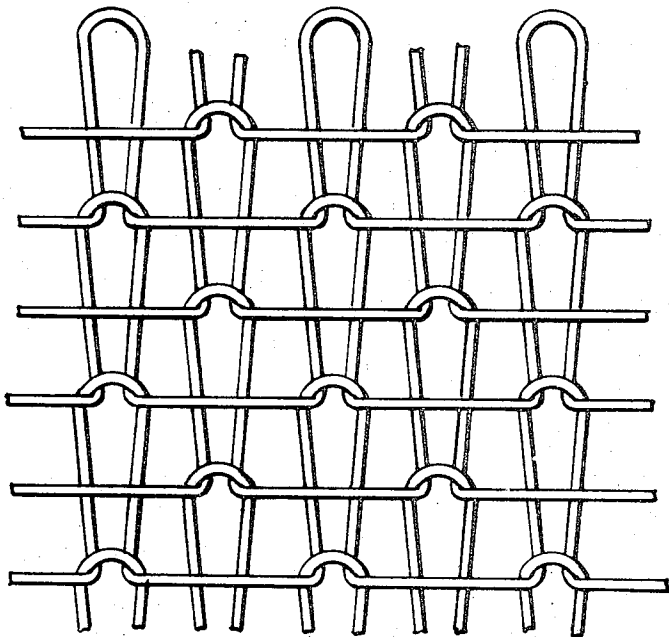
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ABSTRACT

A circular hosiery knitting machine in which the toe is closed by twisting on the machine. The stocking is knitted in the normal direction, starting with an in-turned double welt in the usual manner. Going into the toe, heavier yarns are introduced with circular knitting using two feeds, and loops are transferred onto the dial jack and held during subsequent knitting of the toe, with the needles alternately knitting and welting during knitting of the toe portion. At the completion of the toe knitting, the dial is allowed to rotate one revolution with respect to the body to introduce a twist between the dial loops and the needles. After the twisting has been done, the loops are transferred onto the needles and knitted in, after which additional fabric courses defining a tab are knitted with an anti-ravel structure, and the stocking is pressed off.

3 Claims, 8 Drawing Figures



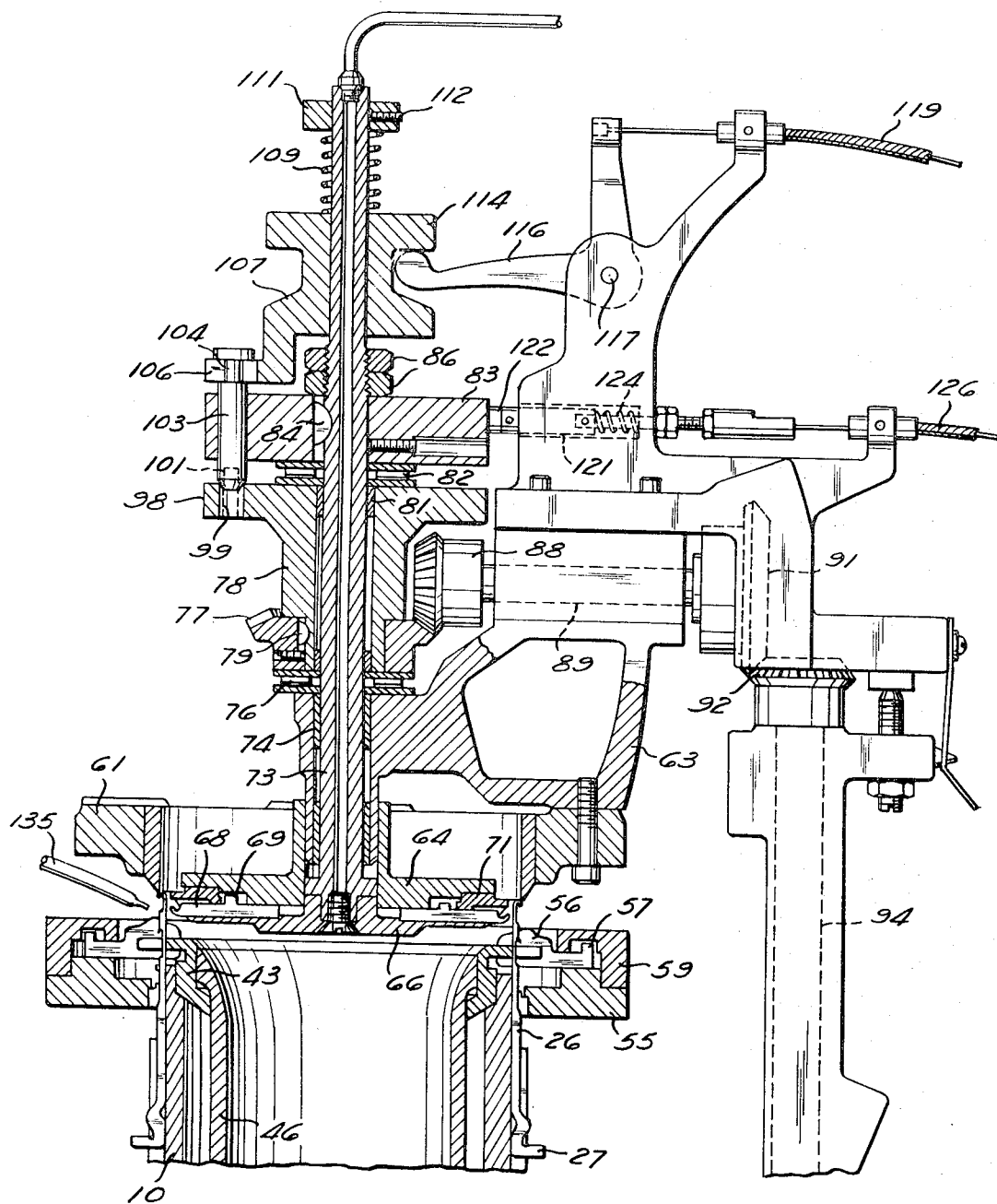


Fig. 1

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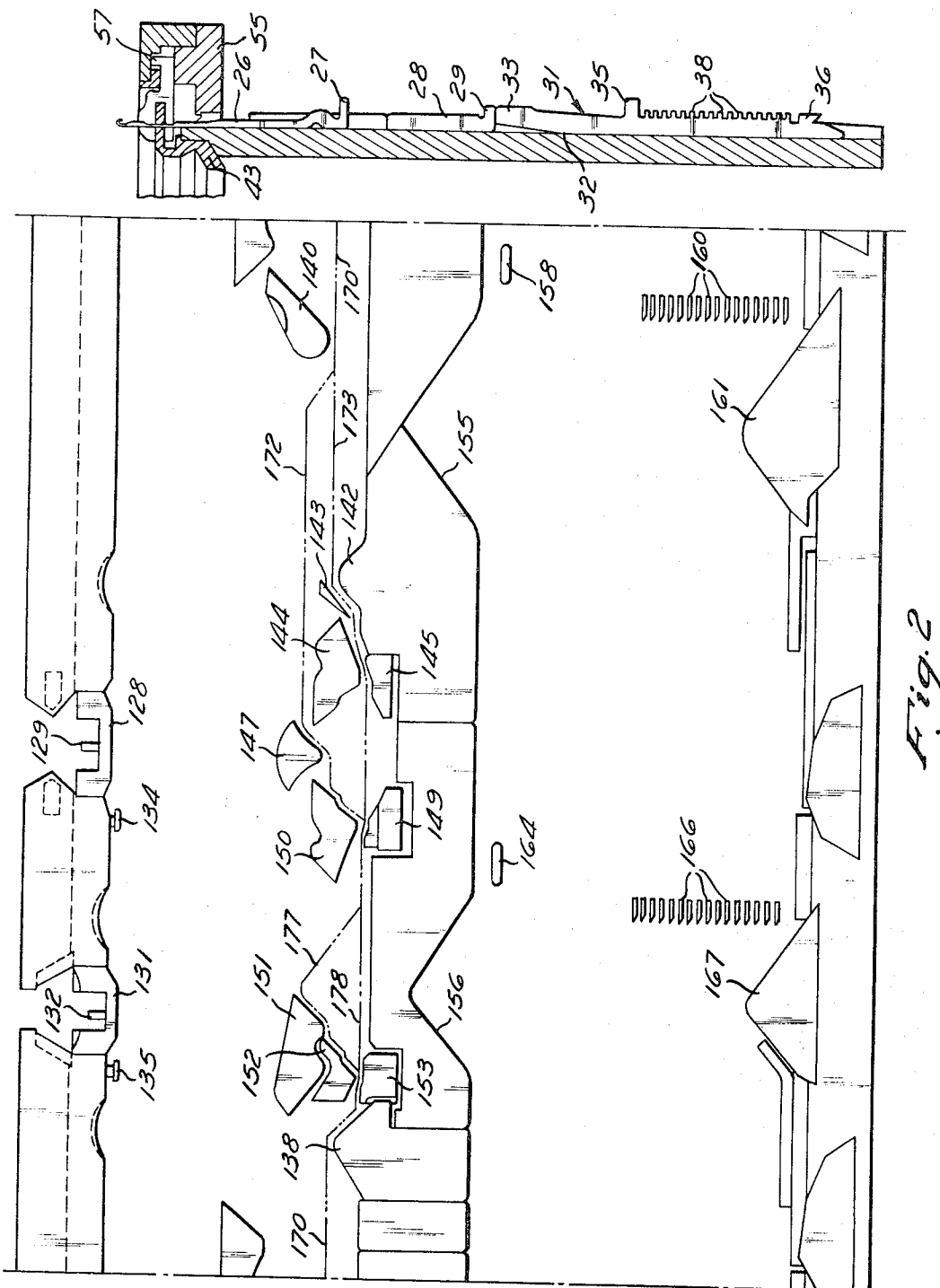


Fig. 2

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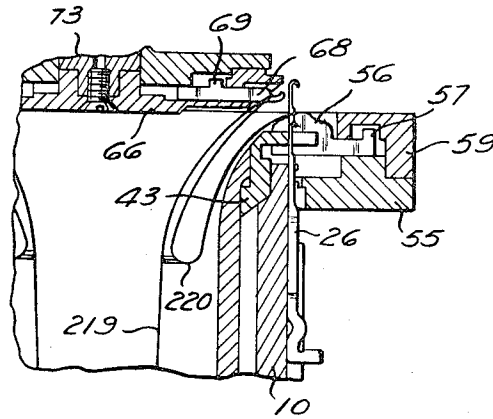


Fig. 3

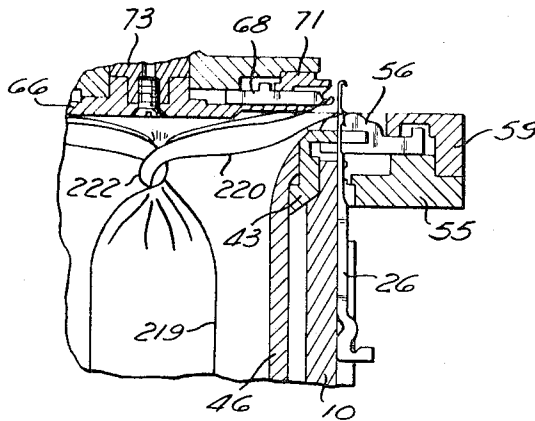


Fig. 4

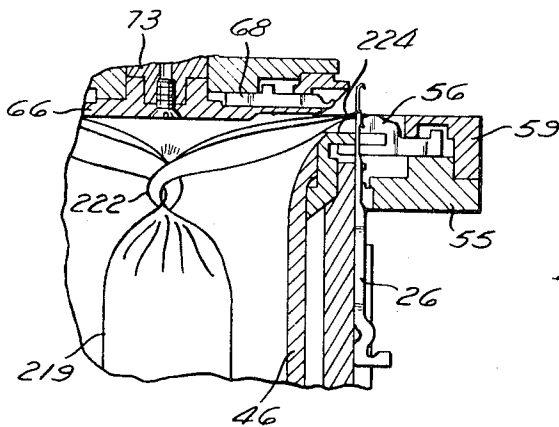


Fig. 5

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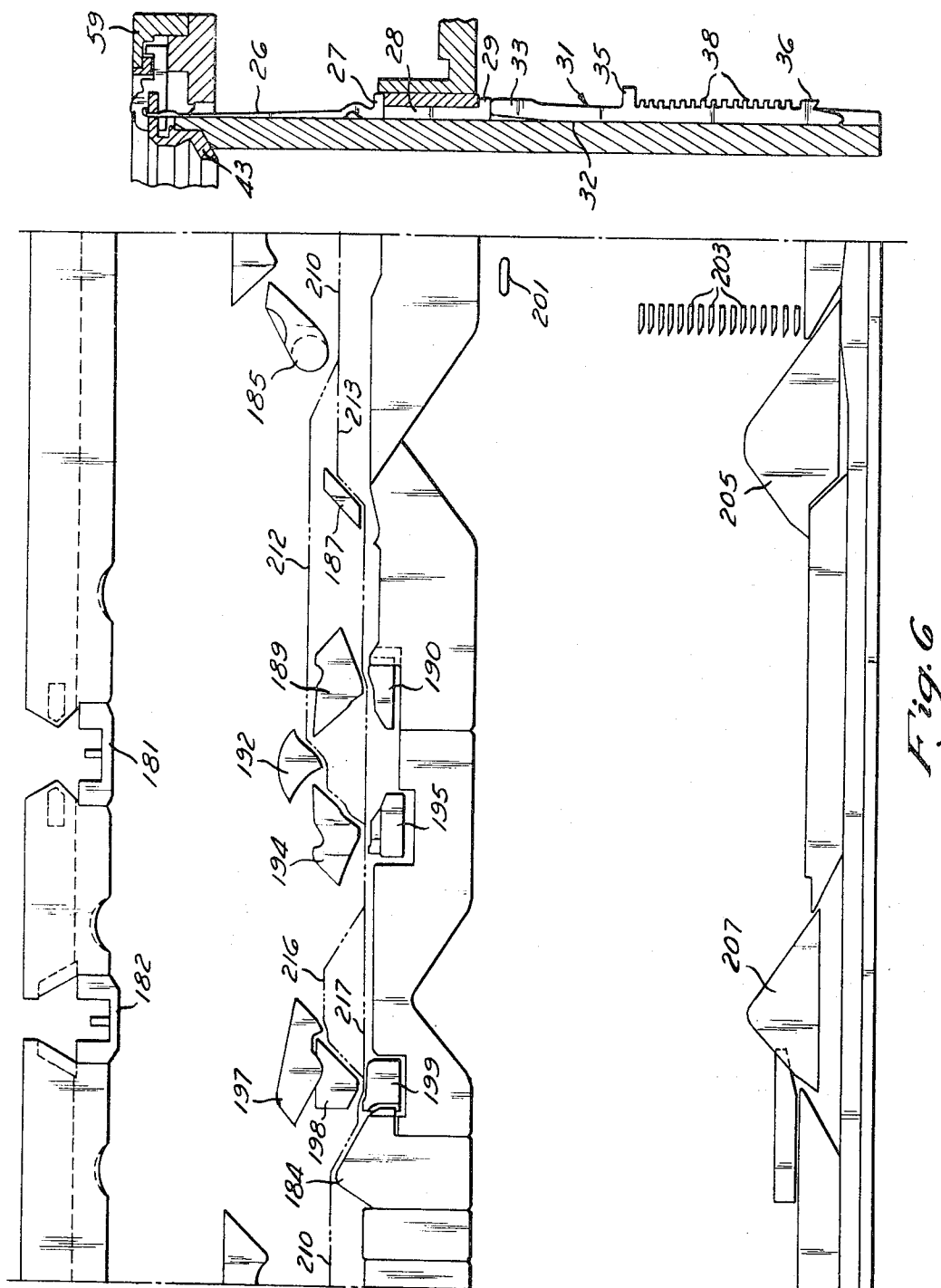


Fig. 6

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Fig. 7

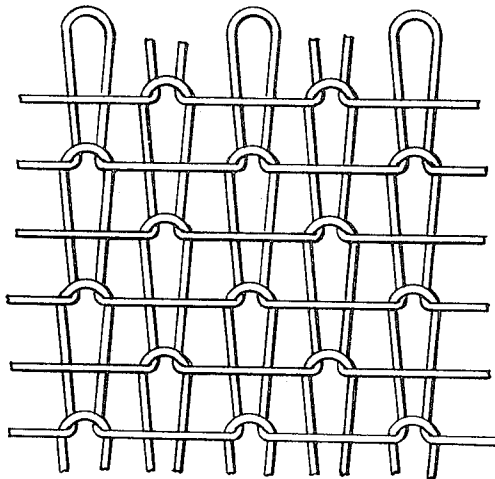
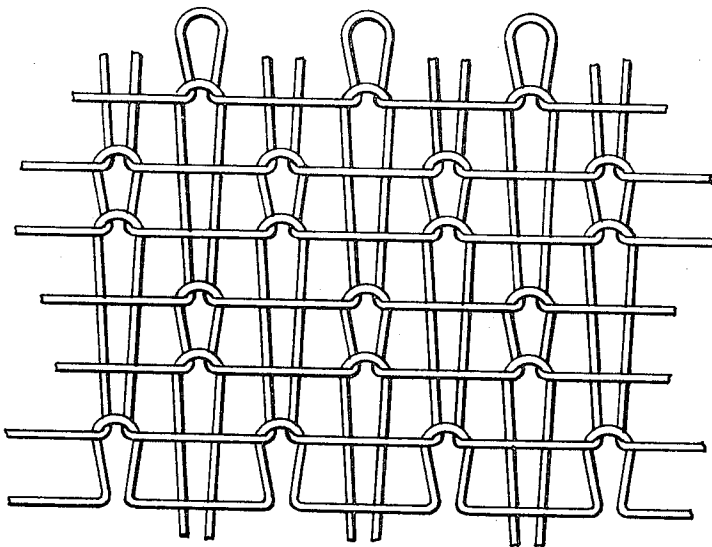


Fig. 8

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STOCKING WITH TWO PLY TOE

This application is a divisional application of application Ser. No. 752,937 filed Aug. 15, 1968, now U.S. Pat. No. 3,685,321.

BACKGROUND OF THE INVENTION

This invention relates generally to circular hosiery knitting machines and more particularly to circular hosiery knitting machines in which the toe is closed on the machine by constricting folded plies of the fabric and knitting the courses together again to lock the plies in position.

Stockings of this general type and the machinery and methods for making such stockings are described in patents of J. A. Currier, U.S. Pat. No. 3,327,500, dated June 27, 1967, and U.S. Pat. No. 3,340,706 dated Sept. 12, 1967. As described in these patents, a stocking is knitted toe first in the reverse of the usual direction with an intumed welt being formed toward the end of the knitting. Because the stocking is made up on the toe, the transfer of the toe fabric after twisting produces a smooth fabric in the normal manner of welt turning. However, in knitting in the reverse direction, after the welt has been turned, knitting must be continued and terminated in the form of a tab or projecting band of knitted material which may be made run-resistant either by the knitting of run-resistant courses or by other treatment such as fusing of the yarns. According to these patents, the resultant tab is located in the lower edge of the welt leaving the toe portions free of any projecting portions of the fabric.

Also, knitting from the toe allows the toe fabric, being of relatively small diameter in the finished stocking, to be made up on less than the full number of needles. Thus, the fabric bulk at the toe is greatly reduced on a 400 needle machine by making up on only half or 200 of the needles and using only this many needles for knitting the toe fabric of both portions or plies of the double layer material in the toe. Just prior to toe closing and transfer the remaining needles are brought into action and knitting of the stocking continued on the full number of needles. This has been recognized advantageous in reducing the bulk of the fabric while allowing the use of a relatively heavier denier yarn to provide the necessary strength and snag resistance required in the toe area. Thus, these heavy yarns are used for all except for the courses constricted together at the very center of the closing of the toe where a lower denier yarn may be used since the fabric is not particularly subject to wear at this point.

SUMMARY OF THE INVENTION

The present invention has as its principal object the provision of methods and apparatus for knitting hosiery having a closure of the toe by constriction of the fabric in which the stocking may be knitted in the normal direction with the stocking being made up at the welt and terminated after closing of the toe while providing a considerable reduction in the bulk of the toe fabric.

Another object of this invention is to provide in closed toe hosiery as set forth in the preceding objects a fabric construction in the closed toe portion in which the number of fabric loops per course are reduced without any drop stitches and knitting continues on all needles.

Another object of this invention is to provide closed toe hosiery and a method of knitting such hosiery as set

forth in the preceding object in which the projecting tab is located in the toe portion of the stocking rather than in the welt portion.

Still another object of this invention is to provide in closed toe hosiery as set forth in the preceding objects a reduced bulk fabric construction which has an optimum strength with a minimized tendency to run either in the toe fabric or to allow the start of runs into the remainder of the stocking.

Briefly, the foregoing and other and additional objects of this invention are attained by having all of the needles alternately knit and welt throughout the toe fabric. In a two-feed machine with needle selection at each feed, one group of alternate needles receives yarn at the first feed position with the intervening needles remaining in welt position, and after stitch formation, those needles receiving yarn at the first needle position remain at the welt position while the other needles are raised to the clear position to receive yarn and knit at the second feed station. With this arrangement, one by one knit and welt fabric is produced in which each course has only half as many loops as there are needles so that each needle knits only on alternate courses. This gives a more open fabric with only half as many loops as in a standard jersey fabric and the resultant loop reduction reduces the fabric bulk without adversely affecting the construction of the fabric necessary for proper stretch and shape. In another embodiment with needle selection only at the main feed, alternate needles knit and welt at both feeds on one revolution of the needle cylinder and reverse this action on the next revolution.

Further features and advantages of this invention will readily become apparent to those skilled in the art upon an understanding of the following detailed description of the preferred embodiments of this invention taken in conjunction with the accompanying drawings in which:

FIG. 1 is a vertical section through the upper portion of a knitting machine according to the present invention;

FIG. 2 is an inside development of the elements, including cams, cooperating with needles and associated elements of the machine, including at the right side of the development in vertical alignment a cross-section of the needle cylinder and its associated elements;

FIG. 3 is a fragmentary vertical section showing a stocking during knitting prior to the closing of the toe;

FIG. 4 is a vertical section similar to FIG. 3 after closing of the toe and prior to the transfer of the loops from the dial to the needles;

FIG. 5 is a vertical section similar to FIGS. 3 and 4 after transfer and just prior to press-off;

FIG. 6 is an inside development of the cams and control elements similar to FIG. 2 according to another embodiment of this invention;

FIG. 7 is a fabric diagram illustrating the stitch formation of the fabric in the closed toe according to the preferred embodiment of this invention; and

FIG. 8 is a fabric diagram of the toe fabric according to another embodiment of this invention.

Referring now to the drawings in greater detail, and in particular FIG. 1, there is shown therein portions of the conventional fine gauge circular hosiery machine used for producing ladies hosiery. While many elements of the machine, such as cams and patterning mechanism, have been omitted for purposes of clarity,

it will be understood that such structures, as well as the remaining portions of the machine, may be conventional in both structure and operation except as described in detail hereinafter.

The needle cylinder 10 is mounted for rotation and vertical movement in the conventional manner and is provided with vertical slots on its outer surface to receive latch needles 26 having butts 27, below which are located intermediate jacks 28 (See FIG. 2) having butts 29. Below the intermediate jacks are the pattern jacks 31 which are of the tiltable type for rotation about a fulcrum 32. These pattern jacks 31 have upper ends 33 both for engaging the intermediate jack 28 and for camming purposes to rock the jack about the fulcrum 32 to tilt the lower ends outwardly for selection in the conventional manner. At the lower end, the pattern jacks 31 have upper and lower butts 35 and 36 respectively, between which are located removable butts 38 for needle selection using selector levers and pattern drums in the well-known manner. It will be understood that the pattern mechanism and presser cams for engaging the butts 38 are provided in the conventional manner.

Within the upper end of the needle cylinder 10 is mounted a cylinder top 43. Within the cylinder top 43 is mounted an insert or liner 46 which guides the stocking and cooperates with the takedown which may be of any conventional type.

Also at the upper end of the needle cylinder 10 are mounted the usual sinker ring 55 carrying sinkers 56 for both rotary and vertical movement with the needle cylinder. The sinkers 56 are provided with the usual butts 57 for actuation by cams mounted within the sinker cap 59.

Directly above the needle cylinder 10 is mounted the latch ring 61. The latch ring is mounted on the frame of the machine in the conventional manner to allow it to be pivoted upward for access. In turn, the latch ring 61 carries a cross bar or support 63 on which is mounted the dial and its associated mechanism as described in greater detail hereinafter. A dial cap 64 is non-rotatably mounted on the cross bar 63 within the opening of the latch ring 61 and rotatably supports the dial 66 which rotates with the needle cylinder in the conventional manner. The dial is provided with dial jacks or transfer elements 68 having butts 69. It will be understood that the dial cap 64 includes an outer cam ring 71 plus selectively operable cams (not shown) for extending the dial jacks to holding and transfer positions and for withdrawing them within the dial slots.

The dial is rotatably driven by a shaft 73 which extends upward through the cap 64 and is rotatably journaled within the cross bar 63 by suitable bearings 74. On the upper side of the cross bar 63 surrounding the shaft 73 is a thrust bearing 76 interposed between the cross bar and a bevel gear 77 which is non-rotatably mounted on a hub member 78 by suitable means such as key 79. The hub member 78 is mounted for rotation with respect to the shaft 74 by bearings 81 and at its upper end abuts against another thrust bearing 82 interposed between the hub member 78 and a clutch disc 83. This clutch disc 83 is drivingly connected to the shaft 73 by suitable means such as key 84 and the entire assembly is maintained in place by nuts 86 threadedly secured on the shaft 73 to bear against the upper side of the clutch disc 83.

The drive for the dial comes from the bevel gear 77 which is engaged by a pinion 88 mounted on one end of a cross shaft 89 which is rotatably journaled in the cross bar 63. At its other end, the cross shaft 89 carries another bevel gear 91 which meshes with a pinion 92 carried on a tower shaft 94 which is rotatably journaled in bearings carried on the machine frame and driven in timed relationship with the needle cylinder. Of course, since the latch ring 61 is movable, the gears 91 and 92 move out of engagement when the latch ring is raised and proper indexing is provided by index marks in the usual manner.

In order to provide a drive from the hub member 78 to the dial shaft 73, a clutch arrangement is used so that upon disengagement of the clutch, differential rotation between the cylinder and the dial can be obtained. Thus, the hub member 78 has at its upper end a radial flange 98 having a socket 99 therein. Immediately adjacent the socket 99 is a projecting fixed pin 101. The clutch disc 83 carries a clutch pin 103 which is axially slidable and is located in radial alignment with the socket 99 and fixed pin 101 on the flange 98. In order to provide axial movement of the clutch pin 103, it is provided with the reduced diameter neck 104 on the end projecting beyond the disc 83 to receive a fork 106 secured to a collar 107 slidably carried on the upper end of the dial shaft 73 above the nuts 86. This collar 107 is spring loaded downwardly by a helical spring 109 which abuts at its upper end against an abutment member 111 secured to the dial shaft 73 by suitable means such as set screw 112. The collar 107 is provided with a radial flange 114 engageable on its underside with one arm of a bell crank 116 which is pivotally mounted on the cross bar 63 at pivot point 117. The other end of the bell crank 116 is actuated through a conventional Bowden wire 119 so that upon rotation of the bell crank, the collar 107 is moved upwardly and the fork 106 raises the clutch pin 103 out of its engagement with the socket 99. Movement of the clutch pin 103 a sufficient distance to clear the pin 101 then allows the hub member 78 to rotate without rotating the clutch disc 83. Since the hub member 78 is rotating at a constant speed, it is desirable to increase the differential rotation between the hub member 78 and the clutch disc 83 by applying a brake to the clutch disc. This is accomplished by means of a brake plunger 121 slidably mounted in the cross bar 63 and carrying a brake shoe 122 on the end to engage the periphery of the clutch disc 83. The brake is applied by a spring 124 and is normally held out of engagement by a Bowden wire 126. Thus, when the differential rotation is desired, the clutch pin 103 is disengaged from the hub member and by applying the brake the dial in effect is slowed down as long as the clutch pin 103 is held in the disengaged position. However, as described in greater detail hereinafter, such differential rotation is only desired preferably for a single revolution, and therefore after there has been sufficient relative rotation that the clutch pin 103 has cleared the fixed pin 101, the clutch pin 103 is released to its lowered position where it rides on the surface on the flange 98. This allows the rotation to continue up to a full revolution until the clutch pin 103 abuts against the fixed pin 101 and engages the socket 99 for precise positioning. Thus, the abutting engagement between the clutch pin 103 and the fixed pin 101 will positively prevent more than one revolution from occurring while the socket 99 provides pre-

cise location to insure that proper timing is maintained.

It will be understood that the foregoing mechanism is substantially the same as that disclosed in the aforesaid U.S. Pat. No. 3,327,500 and 3,340,706. However, in those patents, the preferred method of closing the toe of the stocking involved knitting the stocking in the reverse direction, starting at the toe which is made up and knitted on 200 needles until knitting of the toe fabric is substantially completed. At such time, the clutch mechanism is actuated to retard the dial one revolution to introduce a constriction in the toe fabric, after which transfer takes place and the knitting of the stocking is continued in the reverse direction. Thus, the stocking is knit up the leg and goes into the welt in a reverse direction. To allow turning of the welt the dial jacks are extended to retain loops, after which the welt is completed and transfer takes place resulting in the formation of an annular tab of material prior to press off.

According to an important feature of the present invention, the knitting of the stocking is done in the normal direction with make-up starting at the welt on the full number of needles, with the welt being completely knit and the dial loops transferred to form the intumed welt. Knitting then continues down the leg and through the heel which may be made in any way including by reciprocation or by continuous knitting down through the foot toward the toe. At this point, heavier yarns are introduced and the knitting continued for a few courses. If desired, some of these courses may be knit with a non-run construction to provide a barrier against runs or ravelling crossing between the toe portion and the remainder of the stocking. After these courses have been knit, the dial jacks are extended to the make-up position to catch and retain loops for a course, after which the dial jacks are partially retracted to hold these loops and the knitting of the actual toe fabric commences.

If the fabric were knit on all the needles in a conventional manner giving a plain jersey stitch formation, the bulk of the fabric would be excessive unless the yarn were made so light as not to give the necessary strength and wear resistance at this point. On the other hand, it is not possible to drop out any needles because even with the presence of run resist barriers, the drop stitch would tend to cause runs back into the fabric of the foot.

The present invention overcomes this problem and reduces the bulk of the toe fabric without dropping any stitches by knitting on alternate needles with the intervening needles welting to retain their loops but accepting no new yarn. The result of this is the formation of a fabric having a one by one knit and welt fabric as shown in FIG. 9 in which each course has half as many wales as there are needles. The details of how this fabric is knit can be seen most clearly from the cam diagram of FIG. 2. Referring to these figures in greater detail, the cam layout is for a two-feed machine having independent needle selection at each feed station. The main feed is located at a position indicated by the main feed throat plate 128 and a number of yarn fingers are provided at this throat plate, of which only one is shown by way of example at 129. Likewise, the auxiliary feed throat plate 131 is shown as having a typical yarn finger 132. Nozzles 134 and 135 are provided at the main and auxiliary feeds to direct blasts of air inwardly against the fabric which is being produced,

thereby controlling its position and providing the desired tension.

The cam and needle selection elements are shown in FIG. 2 and are generally conventional in arrangement except as described hereinafter. It will be understood that additional cams may be present on the machine which are not shown in FIG. 2 and which have been omitted for purposes of clarity since they do not function during the knitting of the toe fabric as described hereinafter. The cams include a raising cam 138 to raise the needles to tuck position and a switch cam 140 to positively lower any raised needles to a tuck position at the first needle selection station. Continuing onward around the cam zone, there is an additional raising cam at 142 and a lowering cam 143 which intercepts only those needles at or below tuck height to lower them before they pass underneath the reverse stitch cam 144 which has an associated landing cam 145. The center cam 147 serves its usual function to lower needles from a clear position to the tuck level before any such needles at this position are lowered by the forward stitch cam 150 and positioned by its associated landing cam 149. Needles at this position therefore remain at the welt position and at the next feed station encounter the auxiliary stitch cams 151 and 152 and the associated landing cam 153 before passing on to the previously mentioned raising cam 138. In addition, cams are provided at 155 and 156 for lowering the intermediate jacks 28 together with their associated pattern jacks after needle selection has taken place.

The needle selection at the main feed is initiated by the main feed jack pushout cam 158 which acts on the upper ends 33 of the pattern jacks 31 to rock their lower ends outward. The jacks are then selected by means of the cam levers 160 selected in the usual manner from a pattern drum so that the non-selected jacks are rocked back inwardly depending upon the selective operation of the cam levers 160 and their engagement with the individual pattern jack butts 38. Since the selected pattern jacks remain in the outward position, the lower butts 36 are raised by contact with the jack raising cam 161 so that the selected jacks together with their intermediate jacks and needles are raised upward from the tuck position to the clear position so as to receive yarn at the main feed station. Where the pattern jacks are not selected and are rocked back inwardly, the lower jack butts 36 miss the jack raising cam 161 and therefore the associated needles continue onward at the tuck position.

Likewise, before the auxiliary feed station, a similar selecting arrangement is provided utilizing a jack pushout cam 164 and cam levers 166 which cooperate with a jack raising cam 167 to raise the selected jacks and needles to the clear position to receive yarn at the auxiliary feed, while the non-selected needles remain at welt position at this feed station.

The paths of the needle butts are shown more clearly from the phantom line paths indicated on FIG. 2. Leaving the raising cam 138, all of the needle butts are at the tuck position and continue there past the pattern selection at the main feed station and past the switch cam 140 where the odd numbered needles are raised to clear height to follow the path indicated at 172 while the even needles remain in tuck position indicated at 173 until they pass the raising cam 142 where they are lowered to the welt position by the lowering cam 143 and then to the knockover position by the reverse stitch

cam 144 where they remain as they pass the main feed station. The odd needles raised to the clear height at 172 remain in this position and pass above the reverse stitch cam 144 until they receive yarn and they are lowered by the center cam 147 down to the tuck height where they contact the forward stitch cam 150 which lowers them progressively to the knockover height until they are raised back to welt height by the landing cam 149.

At this point, needle selection takes place for the auxiliary feeding station where the selection is the opposite of that which took place at the main feeding station. At this point, the even needles which previously were held to a welt position at the main feed station are now raised to the clear position 177 by the action of the auxiliary jack raising cam 167 to receive yarn at the auxiliary feed station. These even needles follow the path indicated at 177 where they are lowered by the auxiliary stitch cams 151 and 152 back to a knockover position where they join the path of the odd needles which remained at the knockover or welt position at 178 until they pass the landing cam 153 and are again raised to the tuck position by the raising cam 138.

The result of this stitch selection is to produce the one by one welt stitch shown in FIG. 7. Because the needles are selected so that they knit at only one or the other of the two feed stations, depending upon whether the needles are odd or even, only 200 stitches or loops appear on each course and the position of the stitches or loops alternates from one course to the next. This reduction in the number of loops in the fabric results in a considerable reduction in the bulk of the fabric even though all courses remain continuous without any drop stitches and all the needles remain in operation throughout the toe fabric.

After the toe has been completed using this fabric stitch, the stocking assumes the arrangement shown in FIG. 3. At this point, the foot fabric 219 extends down from the dial jacks 68 with the toe fabric 220 forming a loop from the dial jacks to the needles 26. The clutch pin 103 is now raised and the dial is slowed down to produce a single rotation of relative twist between the portions of the fabric held by the dial jacks and the portions held by the needles. This results in a constriction of the toe fabric around the stocking as shown at 222 in FIG. 4 in which the toe is in effect inside out at this point with the fabric extending through the twisted and restricted opening. At this point, the needle selection may be changed to knit a normal jersey stitch in which all needles knit at each feed station and then transfer will take place in the well known manner as shown in FIG. 5, after which suitable run-resistant stitches may be knit prior to press-off to form a tab 224. After the stocking has been pressed off, it is then necessary to reverse the toe by pulling the toe fabric back through the constricted opening so that the tab 224 which appeared on the outside of the stocking as shown in FIG. 5 is pulled back into the inside upon the reversal of the toe material.

In the foregoing embodiment, the invention was applied to a knitting machine of the two-feed type with independent needle selection for each feed station. However, it is possible to utilize a modified embodiment of the invention in machines having a lesser number of needle selection or patterning positions than there are feed stations and the embodiment shown in FIGS. 6 and 8 shows the invention applied to a two-

feed machine with only a single patterning or selection station for the main feed and no separate patterning or needle selection at the auxiliary feed station.

Turning to the cam layout shown in FIG. 6, the machine is shown as having a main feed 181 and an auxiliary feed 182 but has a patterning or needle selection device only for the main feed 181. It will be understood that the machine may have additional cams for performing other functions, and only those cams necessary for an understanding of the knitting to provide bulk reduction at the toe have been shown in FIG. 6. Starting from the raising cam 184 which raises the needles to tuck position, the needles pass to a switch cam 185 and a lowering cam 187 which is positioned to intercept only needles at tuck height to lower them to welt height while missing those needles which have been raised to a clear position. Next is a reverse stitch cam 189 with its landing cam 190 together with the center cam 192 and main feed forward stitch cam 194 with its landing cam 195. For the auxiliary feed station is provided a two-piece stitch cam formed of upper and lower cams 197 and 198, respectively, and a landing cam 199.

Needle selection takes place in the usual manner by means of a jack pushout cam 201 which rocks all the pattern jacks outward at their lower ends together with cam levers 203 which by cooperation with the pattern jack butts 38 rock the non-selected pattern jacks inward at the lower end so that the selected pattern jacks remain outward so that their lower butts 36 rise up on the jack raising cam 205 to raise the selected needles to the clear position. At the auxiliary feed station no needle selection is provided, but there is additional auxiliary jack raising cam 207 to raise the needles previously selected by the cam levers 203 to the clear position for this station. With this arrangement, it will be seen that those needles selected at the main feed station will be raised by both the jack raising cams 205 and 207 while those needles that are not selected will pass both the jack raising cams leaving the needles out of action on this revolution of the needle cylinder.

The operation will be seen more clearly from the path of the needles as shown in phantom lines on FIG. 6. Starting from the raising cam 184, all needles are raised to tuck height following the path indicated at 210 until they reach the needle selection station shown by the cam levers 203. At this point, the selected needles, which preferably are alternate needles such as all odd needles, are raised to the clear position as shown at 212 to be in a position to take yarn at the main feed station. The non-selected needles follow the path indicated at 213 and these needles would be the alternate needles inter-spacing the selected needles, for example the even numbered needles if the odd numbered needles were selected. These non-selected needles follow the path 213 remaining at tuck height until they contact the lowering cam 187 where they are lowered to welt height and pass below the reverse stitch cam 189 until they reach the forward stitch cam 194. The selected needles at 212 remain at the clear height to receive yarn at the main feed station and they are lowered by the center cam 192 and the forward stitch cam 194 so that these needles knit while the non-selected needles have been welting. With all the needles then at welt height, the selected needles are again raised by the auxiliary jack raising cam 207 to follow the path indicated at 216 to the clear position to receive yarn at the auxiliary feed until they are lowered by the auxiliary

feed switch cams 197 and 198 to rejoin the path of the non-selected even numbered needles which have remained in the welt position following the path indicated at 217.

The resultant fabric is shown in FIG. 8 where it can be seen that the needles selected for one revolution of the needle cylinder knit at both stations to form wales on adjacent courses while the non-selected needles do not knot at either station. On the next cylinder revolution, this arrangement is reversed and the previously non-selected needles are now selected to knit at both stations while those needles which knit on the previous revolution now welt at both feed stations. The resultant fabric as shown in FIG. 8 has a bulk considerably reduced from a jersey knit in which all needles would take yarn at all stations and yet since all the needles remain knitting through the fabric, there are no drop stitches which would tend to cause runs or other weakness in the fabric.

The use of the one by one welt stitch has been shown in both embodiments since this stitch achieves considerable reduction in the bulk of the toe fabric while retaining a high degree of dimensional stability. However, other patterns of welt and knit stitches can be used to reduce bulk even more although this may result in some loss in the fabric properties, depending upon the type of yarn being used.

While several embodiments of this invention have been shown and described in detail, it is recognized that other modifications and rearrangements can be resorted to by those skilled in the art without departing from the scope of the invention as defined in the claims.

I claim:

1. A stocking having a foot with a closed toe, said toe comprising a fold having two circularly knit tubular plies of fabric continuous with each other across the fold and having coursewise extending joined terminal portions with the fabric running continuously from the terminal portion of one ply across said fold to the terminal portion of the other ply, said plies being con-

stricted radially together at said fold substantially to fill and close the tubular opening defined by said tubular plies, said terminal portions being joined by interlocked courses of said terminal portions, one of said plies continuing from said interlocked courses in the direction away from said fold to form the foot of the stocking, each course in said toe having a lesser number of loops than in the courses of said foot and said toe having the same number of wales as there are in said foot wherein at least two of every four contiguous courses of said toe include one course consisting of loops in alternate wales extending over at least two courses and a second course consisting of loops in intervening wales extending over at least two courses.

2. A stocking as set forth in claim 1 wherein said loops in said one and said second courses extend over three courses and each of said one and said second courses alternates with an intervening course having loops extending over one course.

3. A stocking having a foot with a closed toe, said toe comprising a fold having two circularly knit tubular plies of fabric continuous with each other across the fold and having coursewise extending joined terminal portions with the fabric running continuously from the terminal portion of one ply across said fold to the terminal portion of the other ply, said plies being constricted radially together at said fold substantially to fill and close the tubular opening defined by said tubular plies, said terminal portions being joined by interlocked courses of said terminal portions, one of said plies continuing from said interlocked courses in the direction away from said fold to form the foot of the stocking, each course in said toe having a lesser number of loops than in the courses of said foot and said toe having the same number of wales as there are wales in said foot, wherein said toe consists of alternate courses consisting of loops in alternate wales extending over two courses and intervening courses consisting of loops in intervening wales extending over two courses.

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