May 17, 1938. W. N. TAGGART 2,117,920

CIRCULAR KNITTING MACHINE AND PROCESS OF KNITTING

Filed Nov. 1, 1929 3 Sheets-Sheet 1

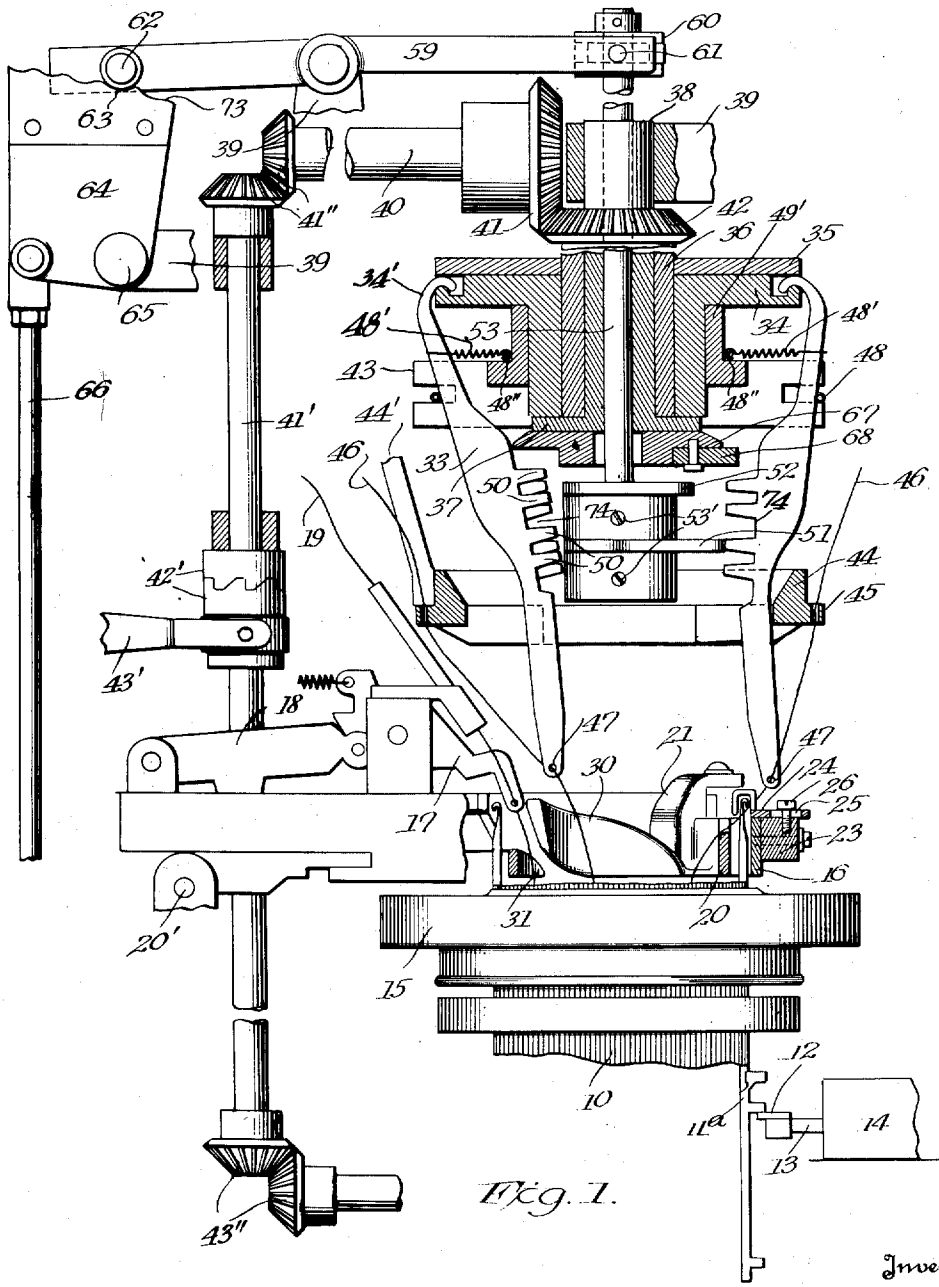


Fig. 1.

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CIRCULAR KNITTING MACHINE AND PROCESS OF KNITTING

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Fig. 2.

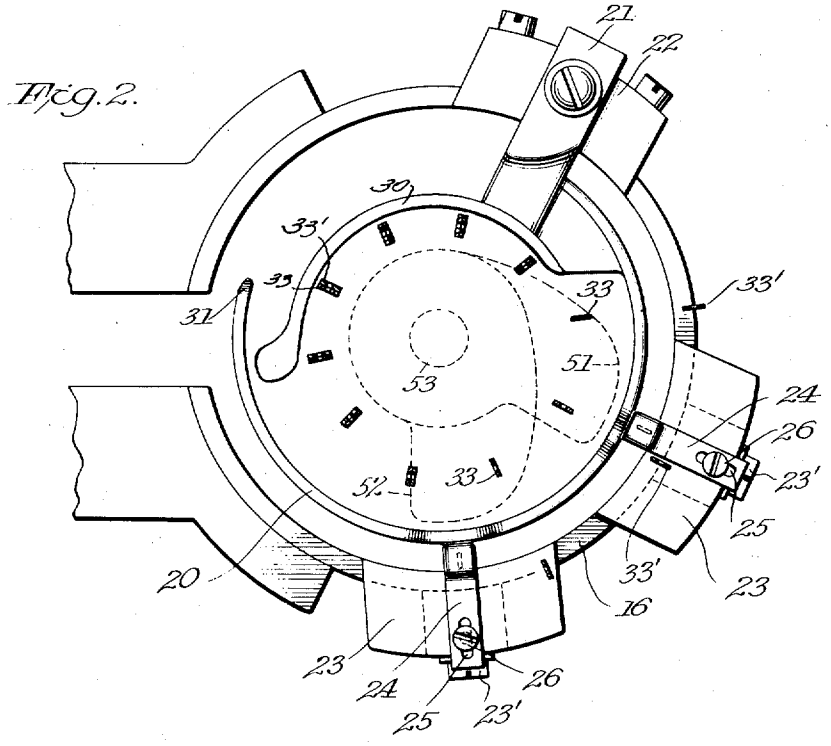
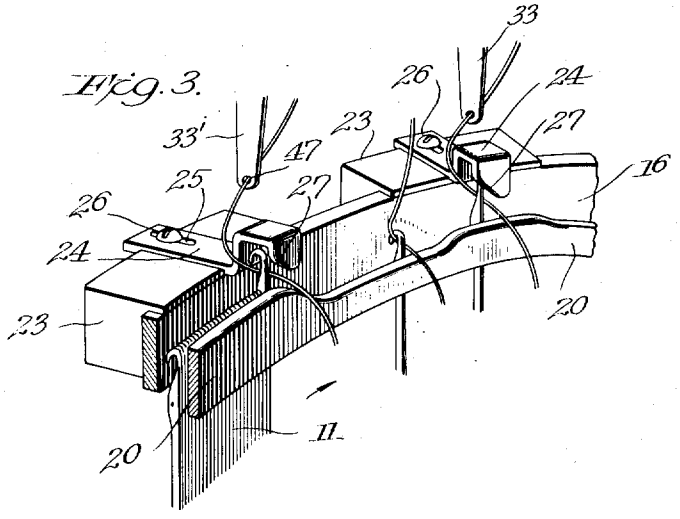


Fig. 3.



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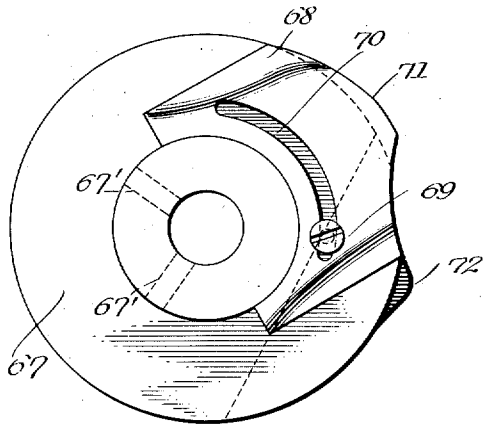
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CIRCULAR KNITTING MACHINE AND PROCESS OF KNITTING

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Fig. 4.



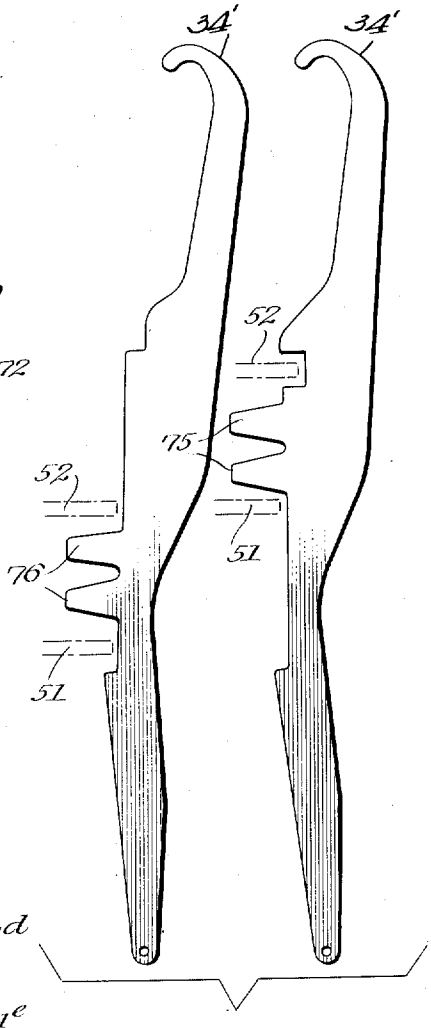


Fig. 5.

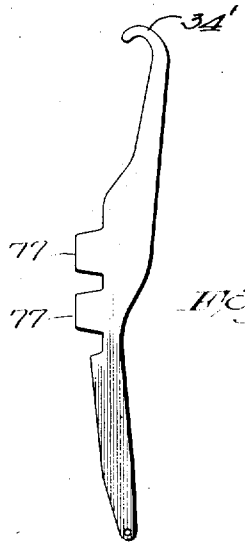


Fig. 6.

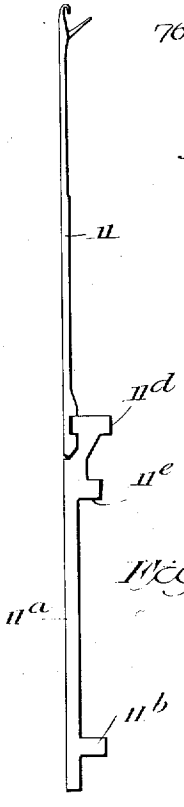


Fig. 7.

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Patented May 17, 1938 2,117,920

UNITED STATES PATENT OFFICE

2,117,920

CIRCULAR KNITTING MACHINE AND PROCESS OF KNITTING

William N. Taggart, Manoa, Pa., assignor, by mesne assignments, to Standard Trump Bros. Machine Co., Inc., a corporation of Delaware

Application November 1, 1929, Serial No. 404,024

17 Claims. (Cl. 66—135)

My invention relates to pattern yarn feeding mechanism for circular knitting machines and it is an object thereof to provide improved means for making vertical stripes in the fabric produced thereon, as well as other patterns and embroidery effects. This machine is of the type in which the patterning is produced by introduction of a separate extra yarn at each point where the pattern is desired. The selection of the needles around which the pattern yarns are to be laid can be accomplished by raising the selected needles to a higher level than the others, as usual. The patterning yarns are supplied from yarn guides which pass the yarns across the needle circle from inside to out and back again.

Referring to the drawings, which are made a part of this application and in which similar reference characters indicate similar parts:

Fig. 1 is an elevation, partly in section, showing part of a circular knitting machine with my invention applied thereto,

Fig. 2 is a horizontal sectional view of the machine of Fig. 1 taken on a line through the feeding ends of the pattern yarn fingers, certain parts being omitted to show others more clearly,

Fig. 3, a detail illustrating the method of supplying the pattern yarn to the needles,

Fig. 4, a detail showing a plan of a cam,

Figs. 5 and 6, detail elevations of modified forms of yarn fingers, and

Fig. 7, an elevation of a needle and jack.

In the drawings, reference character 10 indicates a needle cylinder rotating in a clockwise direction as the machine is shown in Fig. 2, and having needles 11 in its slots as usual, which needles are elevated and depressed by conventional needle knitting cams (not shown). In addition to such needle cams I provide special cams 12, one for each point where needles are to be specially elevated, these cams being mounted on stems 13 movable radially in bearings 14 by suitable pattern mechanism. Jacks 11*a* are located in the needle slots underneath all the needles, or only below certain ones if preferred. The jacks have butts 11*b* coacting with the above mentioned conventional needle raising and lowering cams of any desirable or conventional character for causing the knitting. The jacks also have patterning butts 11*c* and 11*d* at different levels for coacting with the special elevating cams 12. As indicated the patterning butts are of different lengths and they may vary widely in each series, so as to raise needles in varying numbers and in varying sequences according to the positions of the special lifting cams 12 (only one of which is shown in the drawings). In practice it has been found that jacks with upper butts of six different lengths and lower butts of six different lengths can be used with two of the special raising cams 12 described and that such jacks work in satisfactory manner. Obviously this enables me to make a great variety of patterns in the fabric. For example, a long butt jack can be arranged at the middle of a group of several jacks with shorter butts whereby in one position of cam 12 only that needle is raised which is above the long butt jack and in another position both the long butt jack and the medium butt jacks raise their needles into yarn taking position. Many other arrangements will suggest themselves to those skilled in the art.

The machine is supplied with a sinker ring 15, a latch ring 16, one or more main yarn guides 17 and operating means for said guides including levers 18, all of which may be of any conventional or desirable character. By the term main yarn as here used I intend to designate any yarn which may be used in the body of a stocking or in any part thereof, e. g., one of several yarns for making horizontal stripes, splicing yarns or some other yarn or yarns not intended for my special yarn fingers hereinafter described, one such main yarn being indicated at 19.

For the purpose of permitting the striping or patterning yarn to enter the selected needles only and to prevent it entering the needles not selected, a guard 20 is mounted inside the needle circle. This guard is shown as a segmental ring or apron beginning shortly after the knocking over point and ending at point 31 just prior to the knocking over point. The upper edge of this ring is formed as a cam of which certain parts are high to lift a pattern yarn or yarns above the needles not specially elevated at that point to take such pattern yarn or yarns. This ring or apron is supported by a bracket 21 (Fig. 1) secured to a block 22 mounted on the latch ring or other suitable support. This ring or apron forms the subject-matter of certain claims in my co-pending application Serial No. 707,976, filed January 23, 1934, now Patent No. 2,019,940, dated November 5, 1935. Attention is also called to my Patent No. 2,025,913, dated December 31, 1935, claiming certain other subject-matter disclosed in this application, said patent being a division of the present application.

A specially formed separator 30 is secured to or formed integral with block 21 and extends around past the ending point 31 of the segmental ring or apron 20 thereby preventing in-

terference between the pattern yarns and the main yarns or the guides therefor at the point where the main yarns are fed to the needles (see Fig. 1). A main yarn such as that indicated at 19, when put out of action, is cut off by a yarn trap (not shown) which is located at the left hand side of bracket 21 (shown in Fig. 2) and which forms no part of my invention herein claimed. The leading end of the separator 30 is spaced some distance radially inward from the end 31 of the segmental ring 20. The pattern yarns slide inside the lower inclined edge of the separator after they pass the point where they are taken by the needles and are held in idle position within the circle of needles.

One of the principal features of my invention is an element or abutment 24 extending across the needle circle at a distance from the main yarn feeding means and adapted to carry a pattern yarn into contact with the selected needles as the relative rotation between the needles and the abutment 24 takes place. Specifically the abutments 24 are shown as stationary and a pair of circumferentially adjustable blocks 23 held by screws 23' engaging horizontal slots in said blocks serve to support abutments 24 extending radially over the needle circle and each having a hook at its end providing a space through which specially elevated needles move as indicated in Figs. 1 and 3, in taking a pattern yarn. The other needles remain approximately at the level indicated at the left hand side of Fig. 3. The abutments 24 have slots at 25 to receive screws 26 whereby the abutments are attached to the blocks 23 with capacity for radial adjustment so that the recess or gateway for the hooks of the needles will be properly positioned to permit the needles to pass midway of the width of the recess and to prevent it from striking the abutment if it should be bent slightly at its upper end. The downwardly bent outer ends of the hook shaped portions of abutments 24 have inclined faces as indicated at 27 to cause the yarn to slide down past the abutments without being hung up or broken thereby. Preferably the blocks 22 and 23 are supported on the latch ring so that the blocks and the parts carried thereby will be out of the way when the latch ring is swung back about its pivot 20'.

The means for laying the pattern yarns in the path of the abutments and the specially elevated needles comprises one or more yarn fingers here shown as arranged in closely-adjacent pairs 33, 33' having at their upper ends hooks 34' by means of which they are held between two rotating plates 34 and 35 fixed to a hollow sleeve 36 which is supported on a flange 37 of a sleeve 38 carried by a bracket 39 secured to the fixed framework of the machine in any suitable manner. A horizontal driven shaft 40 of the machine drives sleeve 36 through bevel gears 41 and 42. The shaft 40 is driven from a shaft 41' through bevel gearing 41''. The shaft 41' is in two sections adapted to be connected by a clutch 42' through the medium of a lever 43' operated by any suitable pattern mechanism to throw out the clutch at the time when the needle cylinder starts to reciprocate for making heels and toes, at which time the pattern yarn fingers are not operated but are held in idle position by springs hereinafter described. The shaft 41' is driven from a constantly rotating shaft of the machine through suitable connections indicated at 43'' (Fig. 1).

The pattern yarn fingers are guided for radial movement by means of a slotted ring forming guides and supported on said sleeve 36, the guides being indicated at 43. An open ring 44 having inwardly facing guiding slots for the lower ends of the fingers has passages at 45 for the pattern yarns 46 which are led through these passages and then to the eyes 47 at the lower ends of the yarn fingers. The ring 44 is supported by arms 44' depending from a bobbin stand (not shown) arranged between the plate 35 and the gear 42, it being understood that the gear 42 is at a considerable distance above plate 35. Each pattern yarn finger is drawn toward idle position by means of an individual coil spring 48', such coil spring being connected to its finger in any suitable manner, as by means of a hook encircling the pattern yarn finger and being connected at its inner end to a suitable part such as a ring 48'' surrounding a collar 49' which forms part of the fixed frame of the machine. A precautionary spring ring 48 serves to hold the yarn fingers away from abutments 24 in case of failure of one of the springs 48'. It is to be noted that these yarn fingers have a radial movement only relatively to the needles, i. e., they do not move about a needle or group of needles in laying a pattern yarn around the same, their action being supplemented by abutments 24 for this purpose. Circumferentially the yarn fingers are each just in advance of the group of needles around which its yarns can be wrapped.

The pattern yarn fingers are provided near the middle of their length with butts or projections 50 which serve as followers for cams 51 and 52, such cams being arranged in any suitable number on a shaft 53 passing upward through sleeve 38 and being secured thereto by set-screws 53' or the like to permit adjustment of the cams about the shaft. The shaft 53 is pivotally connected at its upper end to a lever 59 by means of a collar 60 and a yoke indicated at 61. This lever 59 is pivoted intermediate its ends to the fixed bracket 39. The lever 59 has a follower 62 at the opposite end of the lever from the collar 60 resting on a cam surface 63 on a pattern element 64 pivoted at 65 to the bracket 39 and having pivotally connected thereto a rod 66 operated by a pattern chain or pattern drum to move the cam 64 about its axis and so cause the lever 59 to swing on its pivot, thereby raising or lowering shaft 53 and its cams 51 and 52 so as to vary the operation of the pattern yarn fingers due to the fact that different followers on the yarn fingers will be engaged by the cams at their various elevations.

It is desirable to move the special yarn fingers outward into the neighborhood of the needle circle before they are actually caused to cross the needle circle by their respective cams 51 and 52. For this purpose I have provided at a point above the cam 52 a support 67 (Figs. 1 and 4). This support comprises a cylindrical portion with threaded holes at 67' for set-screws to hold it on shaft 53 and an overhanging flange, as shown in Fig. 1. A plate 68 is secured to the support 67 by means of a clamping screw 69 passing through a slot 70, said plate having an outwardly projecting cam portion 71 (Fig. 4). This plate is so arranged as to give a preliminary outward movement to a pattern yarn finger which is to be engaged and moved fully out by plate 51. If the plate were not provided the finger would be thrown out with undue speed and suddenness from which damage to the mechanism or an imperfect pattern in the fabric might result. Another cam plate having a cam 72 is secured to the support 67 in proper relation for pre-advanc-

ing pattern yarn fingers which are to be engaged and operated by cam 52. After the fingers have passed the respective pre-advancing and main actuating cams they are pulled back suddenly to idle position by individual springs 48'.

The butts or followers 50 on each pattern finger are shown in the drawings as spaced from each other a distance at least equal to the width of a follower and in Fig. 1 each follower on one finger of the pair is staggered with relation to the same follower of the other finger. In addition the followers are shown with a gap 74 between each such staggered pair of followers. In Fig. 1 each pattern yarn finger is shown as having two pairs of followers and the other finger of the pair has followers lying opposite the spaces in that first named finger, so that according to the up and down adjustment of the cams 51 and 52 such cams will either engage followers on one of the pattern yarn fingers of a pair or on the other according to the desired pattern, unless the shaft 53 is elevated or depressed to such an extent as to bring the upper cam above the plane of all the followers or to bring the lower cam below the plane of all the followers and the other cam opposite gap 74.

In Fig. 2 there are shown ten pairs of pattern yarn fingers and by means of these fingers patterns can be made at ten or more intervals about a stocking or the like, which patterns may of course be interrupted as desired so as to form interrupted stripes or mere spots or any other desired designs. The width of a figure may be varied by circumferential adjustment of blocks 23 or cams 51 and 52, by changing the arrangement of the various sized butts on the jacks, or by moving the special jack cams inward to a greater or less extent according to their pattern control, thereby changing the number of needles to be specially elevated according to the pattern desired. By having the fingers arranged in pairs a finger 33 may for example control a white yarn and a finger 33' may control a red yarn. If now the body of the stocking be of some other color, a pattern may be produced consisting alternately of red yarn and white yarn. As the pattern yarns supplied to specially elevated needles can be changed at any rotation of the machine such changes may take place as often as desired, and the number of colors following each other in the same wales can also be increased by increasing the number of closely-adjacent pattern yarn fingers. It is not desirable that the patterns should continue through the heel or toe of a stocking and usually they are not desired in the sole of the foot. In knitting heels and toes by reciprocation, as usual, or in plain knitting where no patterns are desired, the pattern mechanism moves the cam plate 64 counter-clockwise to a point where the roller 62 engages the low part at 73 of the cam surface 63, whereby cam 52 will pass above the uppermost follower 50 on each pattern yarn finger and cam 51 will pass through the space between the upper and lower pairs of said followers, which is widened for this purpose as indicated at 74 in Fig. 1. For the reason set forth none of the pattern yarn fingers will be oscillated radially and no patterns will be made thereby. It should be noted that the oscillating cam plate 64 has five positions for roller 62, corresponding to the necessary number of positions of cams 51 and 52 for operating or idling the pattern yarn fingers. It is within the bounds of my invention to group more than two pattern yarn fingers at each pattern position. Also a larger number of steps may be provided on oscillating cam plate 64 and the arrangement of followers on the pattern yarn fingers may be correspondingly varied, e. g., by providing three pairs of followers on each finger, etc.

For knitting a stocking with patterns in the leg and instep but not in the heel, toe or sole, pattern yarn fingers such as shown in Fig. 5 are used in the section of the needle circle corresponding to the heel, toe and sole. It will be seen that the upper pair of followers 75 is the same as the upper pair of followers on the corresponding fingers of the pairs shown in Fig. 1, while the followers 76 are the same as the lower pair on corresponding fingers of the pairs shown in Fig. 1. The cams 51 and 52 being positioned either at a low point as indicated at the left hand of Fig. 5 or at a high point as indicated at the right of said figure, the two pattern yarn fingers as shown in Fig. 5 and all similar pattern yarn fingers in the heel section will not be operated by the cams 51 and 52 but the operation of the instep pattern yarn fingers like those in Fig. 1 may be continued. This makes a sole without pattern, but patterns may be placed in the sole if desired, leaving the heel and toe plain; merely by unclutching the clutch 42' during the knitting of the heel and toe.

In Fig. 6 I have shown a pattern yarn finger having only two followers 77 instead of two pairs of followers with a space between them as shown in Fig. 1. Such a pattern yarn finger may be used where a one-color pattern is to be made throughout the length of the stocking, the advantage of this finger being that it is cheaper to make and the single follower wears longer and is less liable to be bent or damaged than the narrower followers of a pair on the fingers in other figures.

In the operation of forming a pattern according to the disclosure of Figs. 1 to 4 it will be seen that as the needles, the pattern yarn fingers and the bobbin stand rotate, a selected pattern yarn finger will first be moved radially by its pre-advancing cam and then by either one of cams 51 and 52 so as to lay its yarn between a specially elevated needle or needles and the hooked end of abutment 24. A needle or a group of needles being elevated into position to pass through the recess in said hook portion of abutment 24, the first of such needles will strike against the yarn which is held in proper position by the hook, and the pattern yarn is carried on through said hook by such needles. Immediately thereafter the cam 51 or 52 releases the pattern yarn finger 33 which returns to its position near the center of the needle circle and the rearmost portion of the bight of yarn laid about the needle or needles will slide over the abutment 24 and down the incline 27 and be held by the retracted needle in the position indicated in connection with the needle in Fig. 3.

The broad claims to the abutment and the method of operating the machine containing the abutment to produce a wrap stripe, are in my divisional Patent #2,025,913 above referred to.

It will be obvious to those skilled in the art that various modifications may be made in my device without departing from the spirit of the invention and therefore I do not limit myself to what is shown in the drawings and described in the specification but only as indicated in the appended claims. It will be obvious also that patterns of many varieties may be made. As one example of such pattern a stripe may be made in one color said stripe being interrupted at intervals

by wider spots of a different color, the yarn for said spots being provided by one of two juxtaposed pattern yarn fingers and the yarn for the balance of the stripe by the other. This is merely one illustration of a possible pattern as it will be obvious to those skilled in the art that many other patterns may be made by varying the position of the cams 51, 52, the lengths of jack butts, the position of cams 12, etc. Thus, for example, by juxtaposing three or more pattern yarn fingers a narrow stripe may show several colors in succession.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a circular knitting machine, a rotary circle of independent needles, a main yarn finger, means for raising at a point on the needle circle different from said main yarn finger needles selected from a segment of the circle of needles, and means for raising at another point another selection of needles from the same segment, in combination with a plurality of lap stripe yarn fingers adapted to lay different yarns across the needle circle at the two points selectively for engagement by needles in knitting the same course.

2. In a circular knitting machine, a rotary circle of independent needles, a main yarn finger, means for raising a selection of needles at a point on the needle circle different from said main yarn finger, and a plurality of lap stripe yarn fingers pivoted on the same axis side by side having a fixed circumferential relation to the needles, in combination with means to oscillate said fingers selectively to lay different pattern yarns across the same point on the needle circle on different courses.

3. In a circular knitting machine, a rotary circle of independent needles, means for raising a selection of needles for wrapping at a point prior to the knitting point, and a plurality of pivotally supported wrap stripe yarn fingers having a fixed circumferential relation to the needles, in combination with means to swing said fingers across the needle circle in front of the same group of needles selectively on different courses.

4. In a circular knitting machine of the independent needle type, means for feeding one or more threads to the needles throughout substantially all the wales and courses, means bearing a fixed circumferential relation to the needles for wrapping additional threads around selected needles, during the knitting of circular courses, said means being adapted interchangeably to wrap two, at least, of the said additional threads around the same needle during the knitting of successive courses.

5. In a circular independent needle knitting machine having needle operating cams, a revolving needle cylinder and main yarn guiding means, a plurality of pattern yarn fingers whose feeding ends bear a fixed circumferential relation to the needles, said fingers being adapted interchangeably to cause a needle to be wrapped.

6. In a circular knitting machine, a rotary circle of independent needles and means for raising needles selectively and independently at two points on the needle circle for wrapping purposes on the same course of knitting, in combination with a plurality of wrap stripe yarn fingers adapted to lay different yarns across the needle circle at the two points for engagement by needles in knitting the same course.

7. In a knitting machine, a rotary circle of independent needles and means for raising needles selectively at two points on the needle circle for wrapping purposes, in combination with a plurality of wrap stripe yarn fingers adapted to lay one yarn across the needle circle in front of any selection of a plurality of needles from a segment of needles at the first of the points, and adapted to lay another yarn in front of any selection of a plurality of needles from the same segment of needles at the second point on the same course of knitting.

8. In a knitting machine, a rotary circle of independent needles and means for raising needles selectively at two points on the needle circle for wrapping purposes, in combination with a plurality of wrap yarn fingers adapted to lay two or more yarns interchangeably across the needle circle in front of the same needle, one or more of said fingers laying a yarn or yarns across the circle at the first of the points on the needle circle and one or more of said fingers laying yarn across the circle at the second point on the same course of knitting.

9. In a knitting machine, a rotary circle of independent needles and a plurality of wrap yarn fingers adapted interchangeably to initiate wrapping operations, in combination with followers on said fingers and a pair of vertically movable cams adapted to contact with said followers, the latter being arranged to leave a vacant space intermediate the end follower positions, and means adapted to move said cams vertically to idle position with one cam opposite the vacant space and the other cam beyond an end follower position simultaneously.

10. The method of applying to two substantially adjacent needles, and for knitting in the same course of stitches, separate threads for each of said two needles in addition to one or more weft threads, which comprises elevating and wrapping one of said two needles at one point on the circumference of the machine, lowering the wrapped needle, displacing the other needle vertically above the first needle at another point on the circumference, wrapping said other needle and thereafter taking ground thread and knitting stitches on both ground and wrap thread on both needles.

11. The method of knitting a pattern or a stripe in a stocking in addition to a continuous ground thread or threads, which comprises elevating a selected needle above adjacent needles at one place in the cylinder of a circular knitting machine, wrapping an auxiliary or pattern thread about the elevated needle to form a portion of a pattern, lowering the wrapped needle, then elevating a needle adjacent to the wrapped needle at another place in the cylinder and in the same course of knitting, wrapping another auxiliary or pattern thread about the elevated needle, and then lowering the wrapped needle.

12. A circular knitting machine of the independent needle type having means for feeding one or more yarns to all the needles, in combination with supplemental means for wrapping at least two threads around selected needles, and means including a plurality of stations for selecting any desired plurality of needles from a group of the needles to be wrapped with one of the threads and selecting any other desired plurality of needles from the same group of needles to be wrapped with another of the threads, the needle wrapping being so controlled as to cause no needle in the group to be wrapped with more than one thread during the knitting of a given course.

13. The method of knitting wale-threads, in

addition to a continuous ground-thread or ground-threads, on two adjacent needles in the same row of stitches, which comprises displacing said needles with respect to each other so that one of said needles is at a higher position than the other, placing a wale-thread on the higher of the two needles, displacing said needles with respect to each other, so that the needle which has received the said wale-thread is at a lower position than the other needle, and then placing a wale-thread on said other needle.

14. The method of knitting wale threads in addition to a continuous ground thread or threads, on two pluralities of needles in the same row of stitches, which comprises displacing one such group with respect to the other so that one is at a higher position than the other, placing a wale thread on the higher group, displacing them with respect to the other group, so that the group which has received the said wale thread is at a lower position than the other group, and thereafter taking ground thread and knitting stitches of both ground and wrap thread then placing a wale thread on the said other group.

15. The method of knitting wale threads in addition to a continuous ground thread or threads, on two groups of a plurality of needles each in the same row of stitches, which comprises displacing one such group with respect to the other so that one is at a higher position than the other, placing a wale thread on the higher group, displacing them with respect to the other group, so that the group which has received the said wale thread is at a lower position than the other group, and thereafter taking ground thread and knitting stitches of both ground and wrap thread then placing a wale thread on the said other group.

16. A circular knitting machine for knitting fabric having wrap threads knitted in on certain stitches, including means for feeding at least one thread to all the needles, in combination with means for wrapping additional threads around selected needles, said means including a wrap finger carrier having a fixed circumferential relation to the needles, and wrap yarn fingers in said carrier movable to and from needle wrapping position, said means being adapted interchangeably to wrap at least two of the wrap threads around the same needle.

17. A circular knitting machine for knitting fabric having wrap threads knitted in certain stitches, including means for feeding at least one thread to all the needles, in combination with means for wrapping additional threads around selected pluralities of needles, said means including a wrap finger carrier having a fixed circumferential relation to the needles, and wrap yarn fingers in said carrier movable to and from needle wrapping position, said means being adapted interchangeably to wrap at least two of the wrap threads around the same plurality of needles.

WILLIAM N. TAGGART.

CERTIFICATE OF CORRECTION.

Patent No. 2,117,920. May 17, 1938.

WILLIAM N. TAGGART.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 4, second column, line 46, claim 10, for the word "on" first occurrence, read of; page 5, first column, lines 23 and 24 and second column, line 6, claims 14 and 15 respectively, strike out the words "then placing a wale thread on the said other group" and insert the same after the comma and before "and" in first column, line 21 and second column, line 4, same claims; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 28th day of June, A. D. 1938.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)

addition to a continuous ground-thread or ground-threads, on two adjacent needles in the same row of stitches, which comprises displacing said needles with respect to each other so that one of said needles is at a higher position than the other, placing a wale-thread on the higher of the two needles, displacing said needles with respect to each other, so that the needle which has received the said wale-thread is at a lower position than the other needle, and then placing a wale-thread on said other needle.

14. The method of knitting wale threads in addition to a continuous ground thread or threads, on two pluralities of needles in the same row of stitches, which comprises displacing one such group with respect to the other so that one is at a higher position than the other, placing a wale thread on the higher group, displacing them with respect to the other group, so that the group which has received the said wale thread is at a lower position than the other group, and thereafter taking ground thread and knitting stitches of both ground and wrap thread then placing a wale thread on the said other group.

15. The method of knitting wale threads in addition to a continuous ground thread or threads, on two groups of a plurality of needles each in the same row of stitches, which comprises displacing one such group with respect to the other so that one is at a higher position than the other, placing a wale thread on the higher group, displacing them with respect to the other group, so that the group which has received the said wale thread is at a lower position than the other group, and thereafter taking ground thread and knitting stitches of both ground and wrap thread then placing a wale thread on the said other group.

16. A circular knitting machine for knitting fabric having wrap threads knitted in on certain stitches, including means for feeding at least one thread to all the needles, in combination with means for wrapping additional threads around selected needles, said means including a wrap finger carrier having a fixed circumferential relation to the needles, and wrap yarn fingers in said carrier movable to and from needle wrapping position, said means being adapted interchangeably to wrap at least two of the wrap threads around the same needle.

17. A circular knitting machine for knitting fabric having wrap threads knitted in certain stitches, including means for feeding at least one thread to all the needles, in combination with means for wrapping additional threads around selected pluralities of needles, said means including a wrap finger carrier having a fixed circumferential relation to the needles, and wrap yarn fingers in said carrier movable to and from needle wrapping position, said means being adapted interchangeably to wrap at least two of the wrap threads around the same plurality of needles.

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Patent No. 2,117,920. May 17, 1938.

WILLIAM N. TAGGART.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 4, second column, line 46, claim 10, for the word "on" first occurrence, read of; page 5, first column, lines 23 and 24 and second column, line 6, claims 14 and 15 respectively, strike out the words "then placing a wale thread on the said other group" and insert the same after the comma and before "and" in first column, line 21 and second column, line 4, same claims; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 28th day of June, A. D. 1938.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)