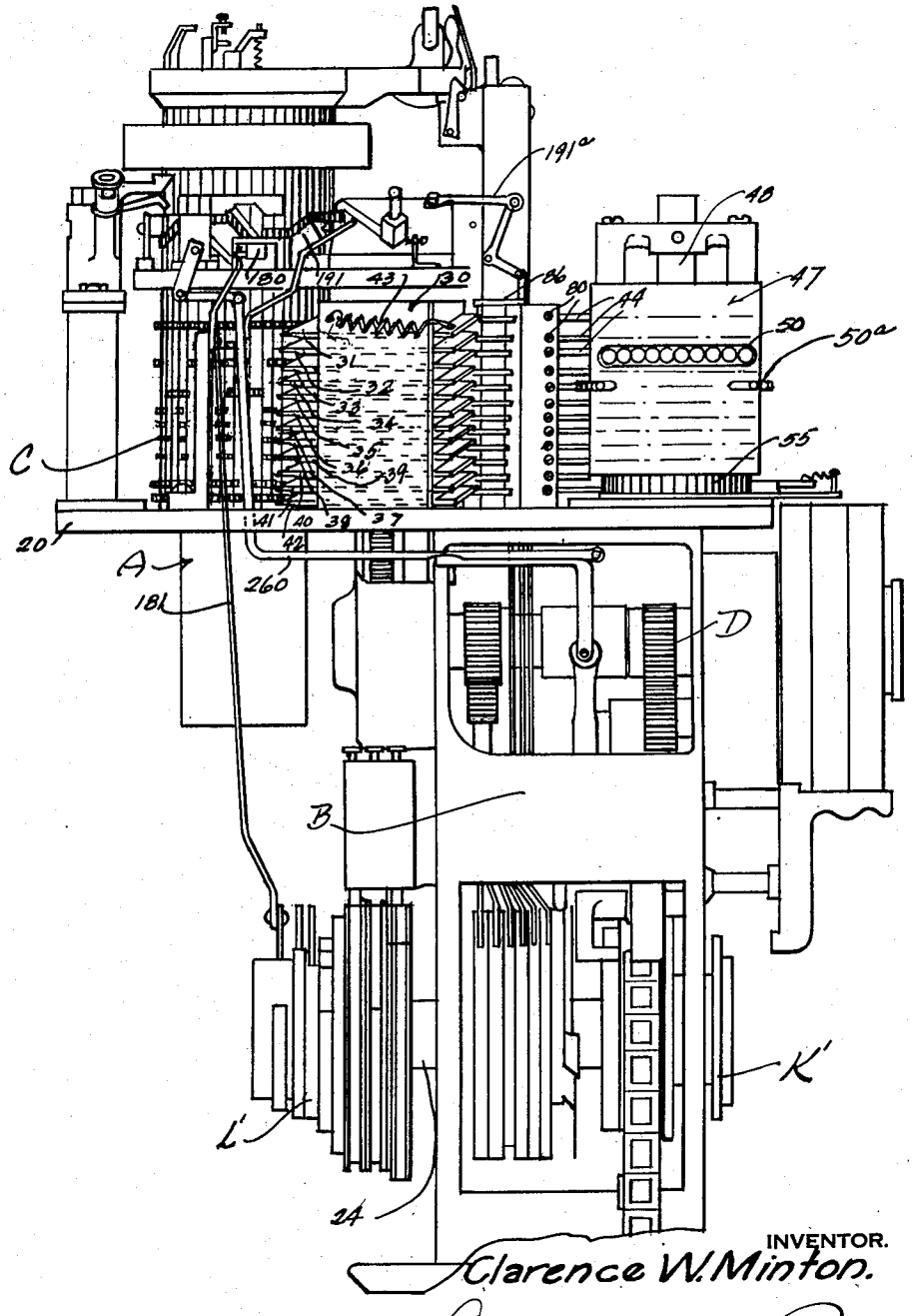
June 12, 1945. C. W. MINTON 2,378,316

MACHINE FOR PRODUCING KNITTED FABRIC

Filed Aug. 12, 1942 8 Sheets-Sheet 1

Fig. 1.



INVENTOR.
Clarence W. Minton.

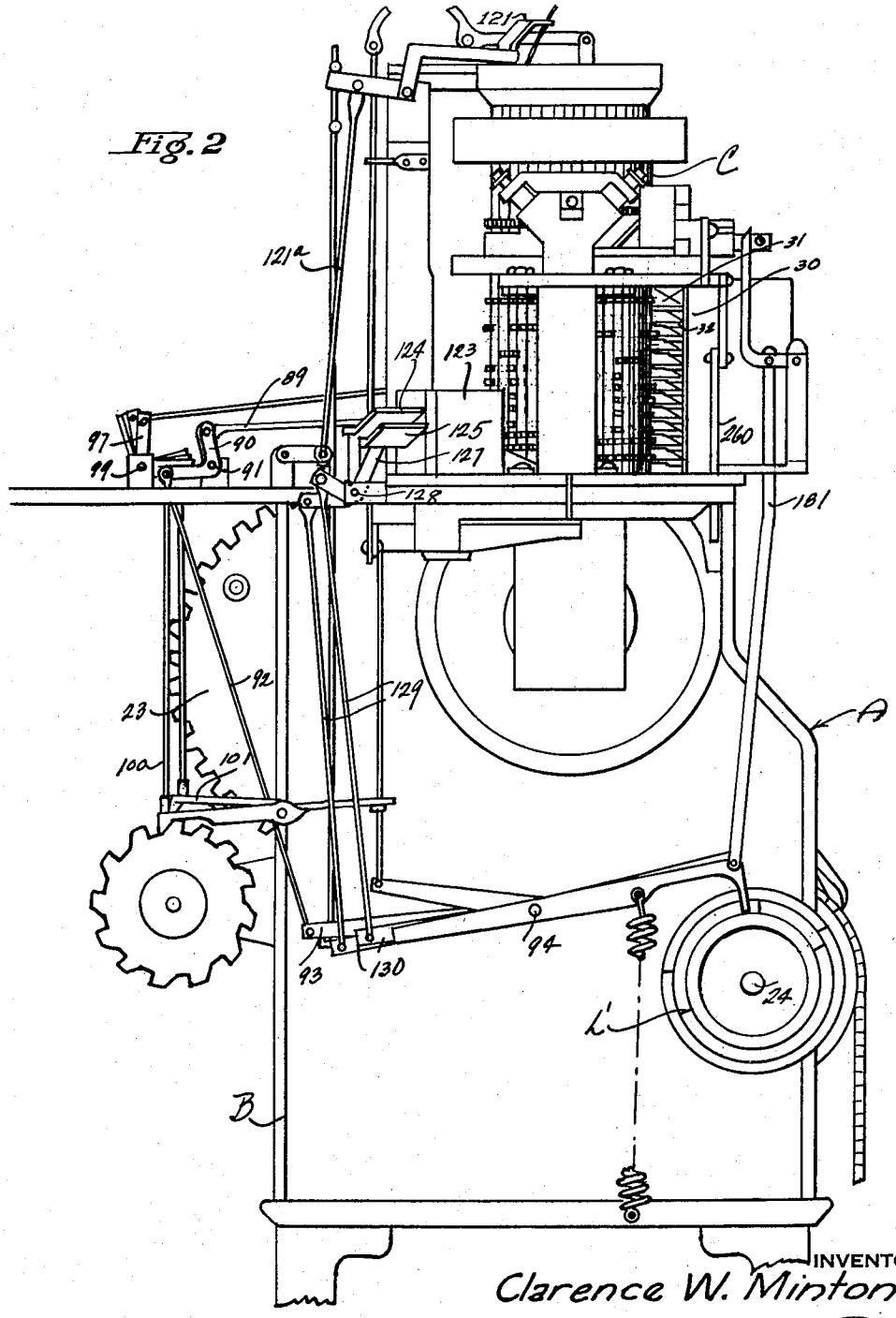
BY Lancaster, Allwine & Rommel
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MACHINE FOR PRODUCING KNITTED FABRIC

Filed Aug. 12, 1942 8 Sheets-Sheet 2

Fig. 2



INVENTOR.
Clarence W. Minton.

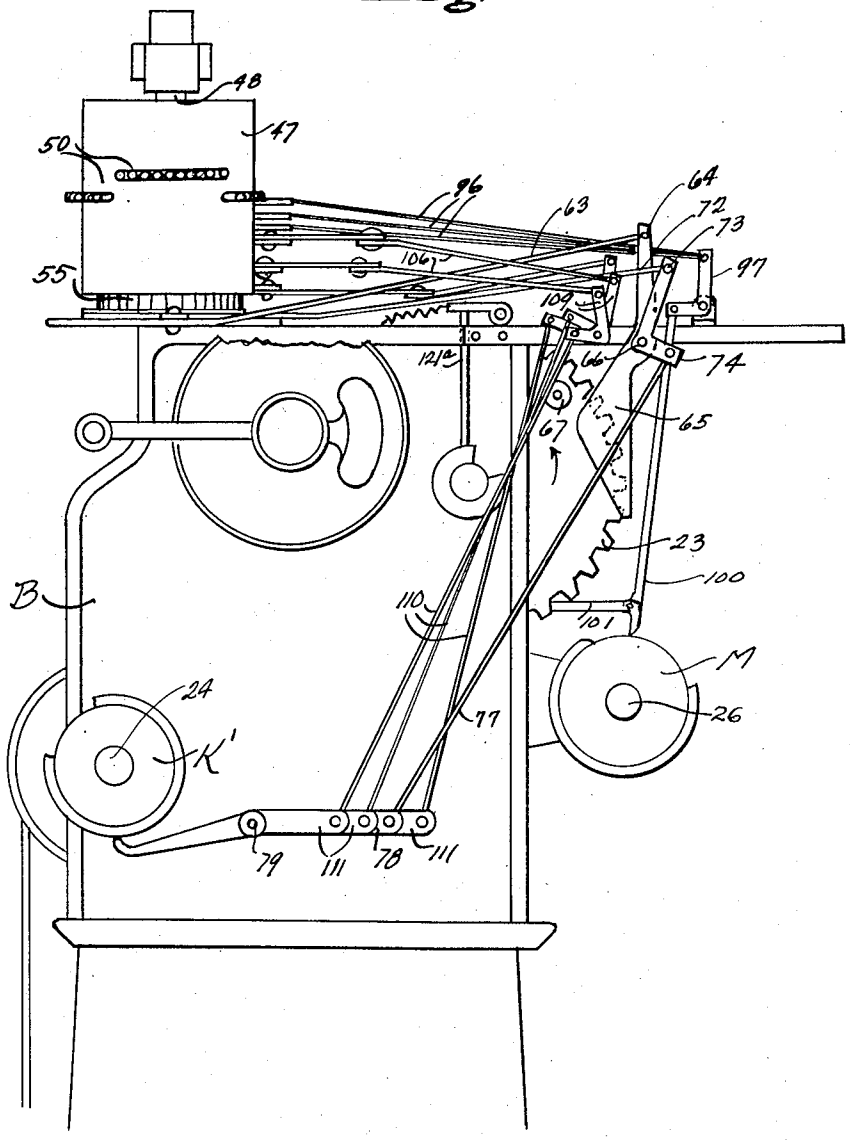
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MACHINE FOR PRODUCING KNITTED FABRIC

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Fig. 3.



INVENTOR.
Clarence W. Minton.

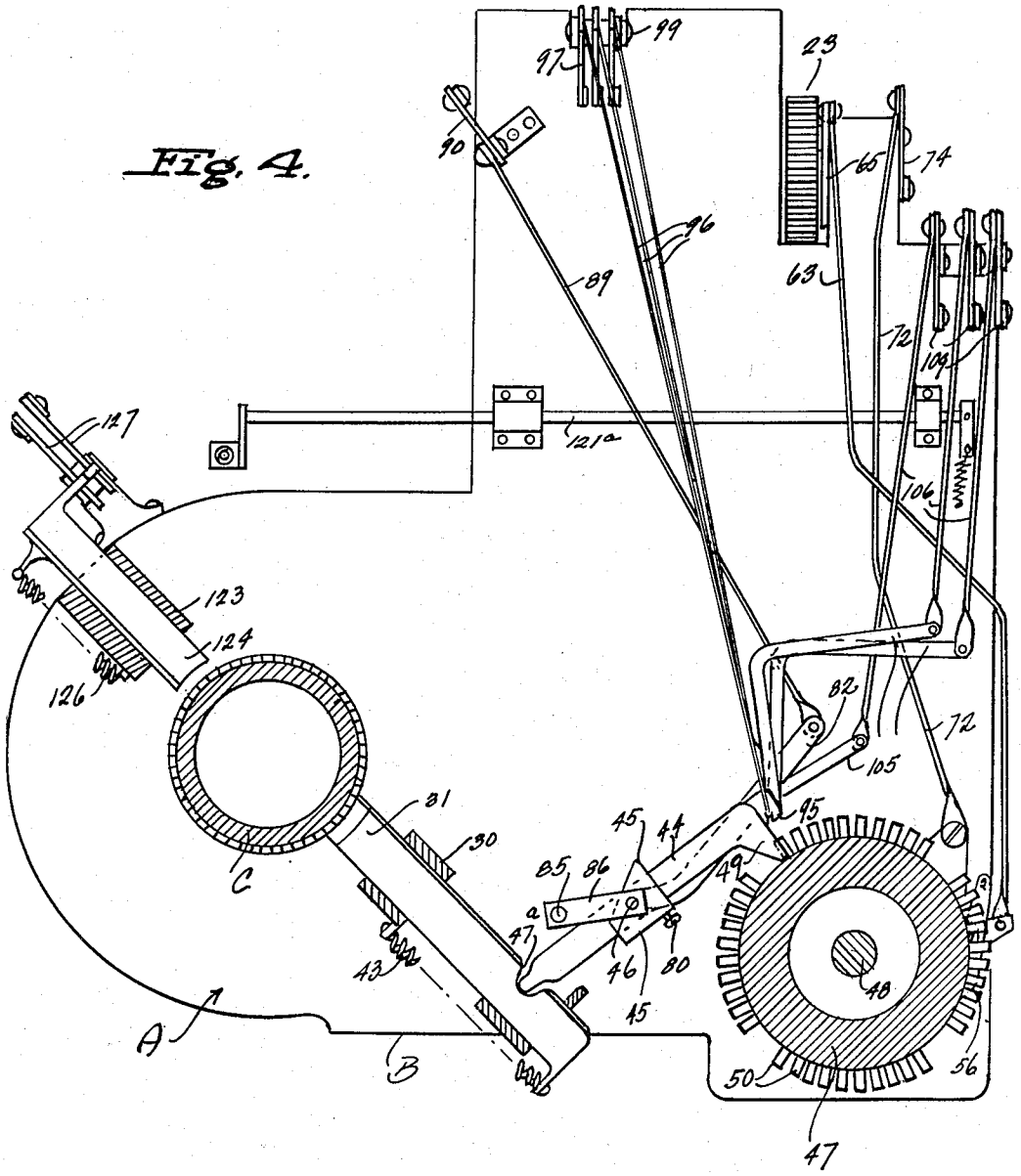
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MACHINE FOR PRODUCING KNITTED FABRIC

Filed Aug. 12, 1942 8 Sheets-Sheet 4

Fig. 4.



INVENTOR.
Clarence W. Minton.

BY Lancaster, Allwine & Rommel
ATTORNEYS.

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MACHINE FOR PRODUCING KNITTED FABRIC

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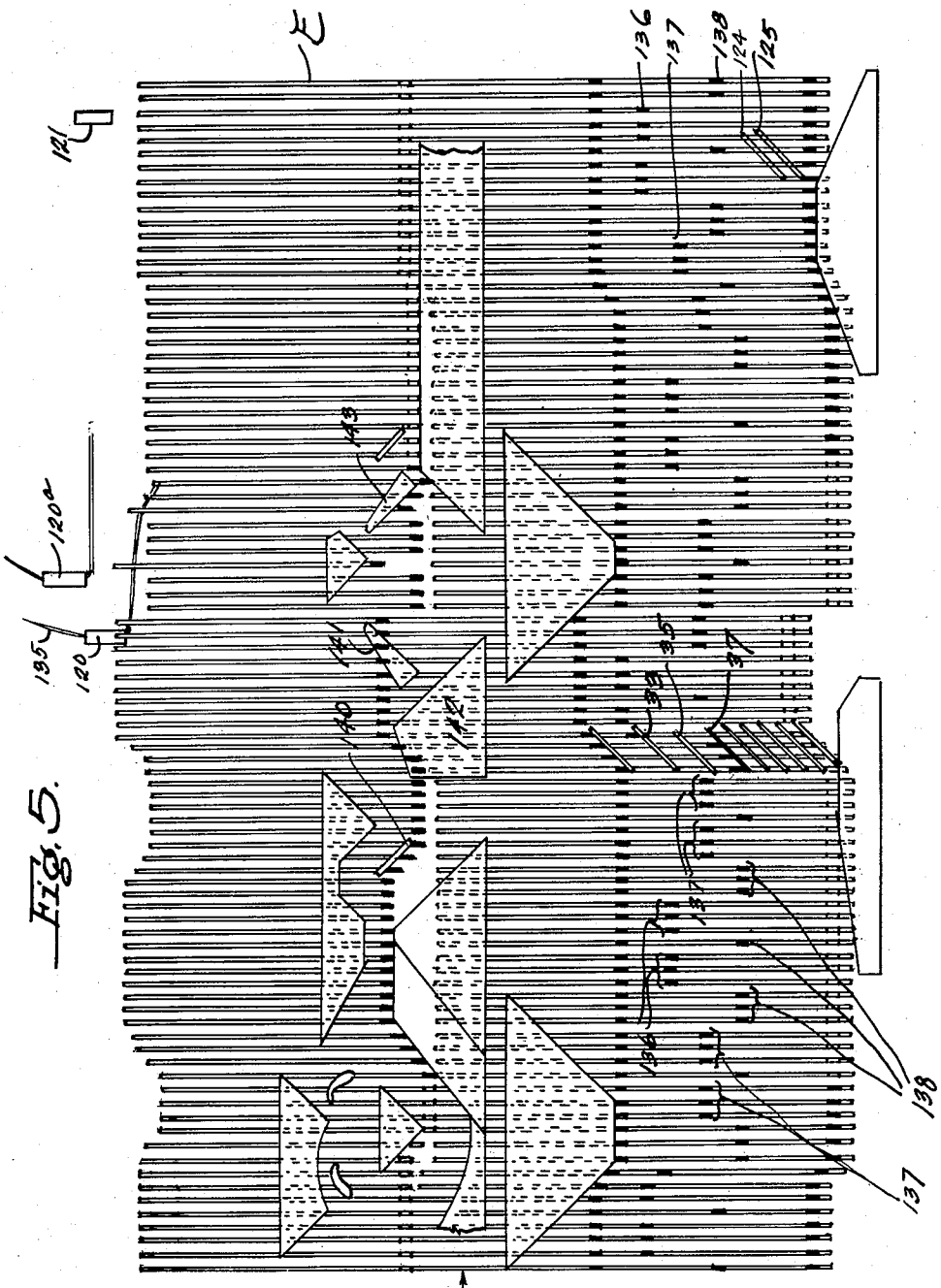


Fig. 5.

INVENTOR.
Clarence W. Minton.

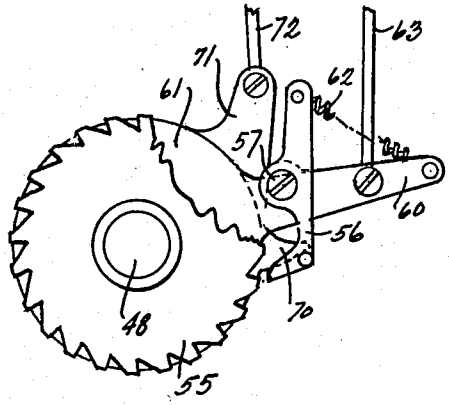
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MACHINE FOR PRODUCING KNITTED FABRIC

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Fig. 8.



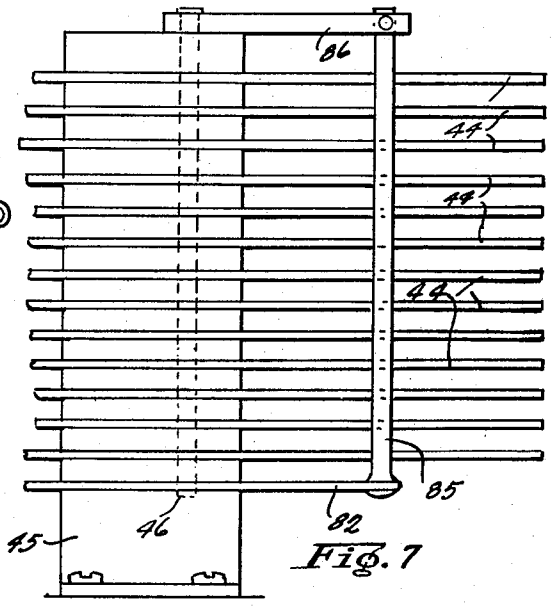


Fig. 7

Fig. 6.

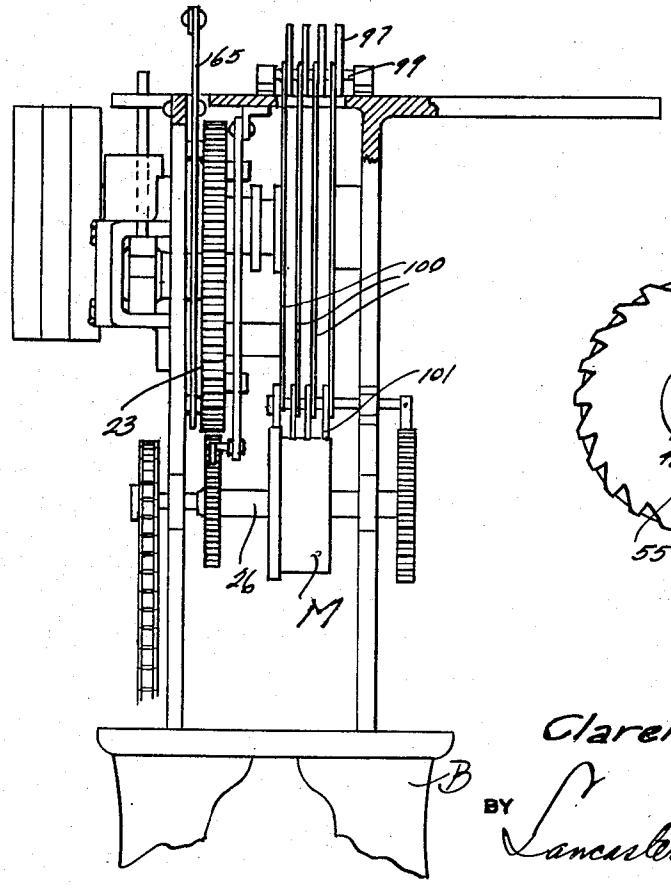
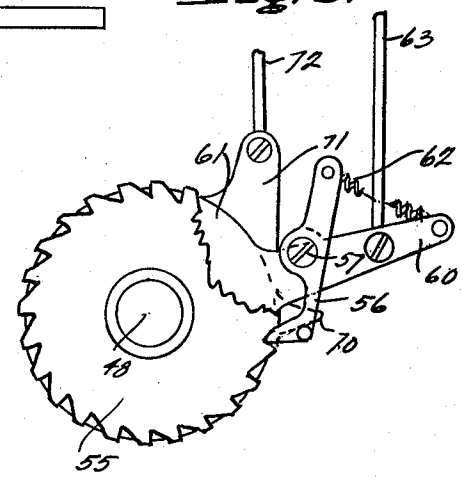


Fig. 9.



INVENTOR.
Clarence W. Minton.
BY Lancaster, Allwine and Rommel
ATTORNEYS.

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MACHINE FOR PRODUCING KNITTED FABRIC

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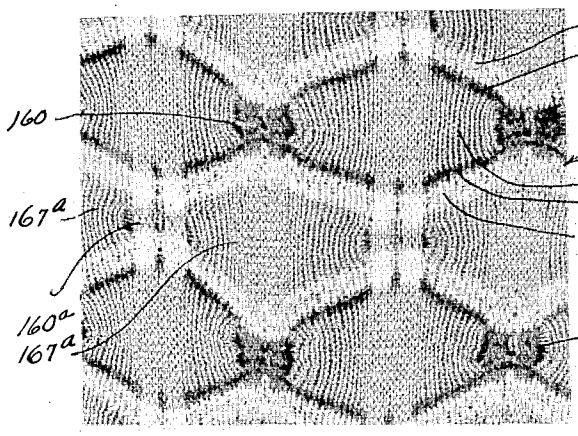


Fig. 10.

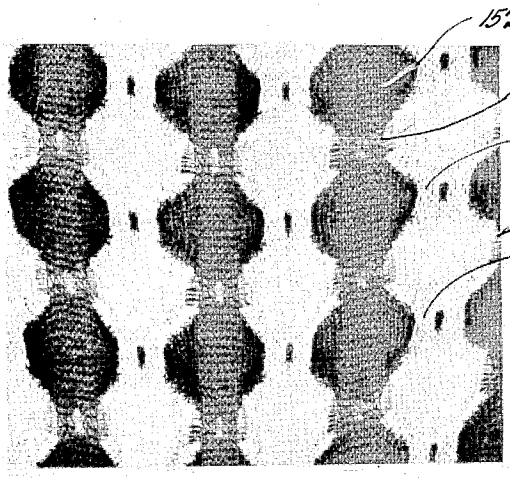


Fig. 11.

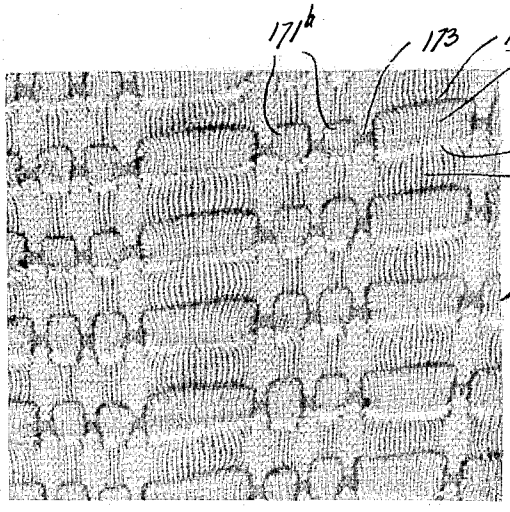


Fig. 12.

INVENTOR.
Clarence W. Minton.

BY Lancaster, Allwine & Rommel
ATTORNEYS.

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MACHINE FOR PRODUCING KNITTED FABRIC

Filed Aug. 12, 1942 8 Sheets-Sheet 8

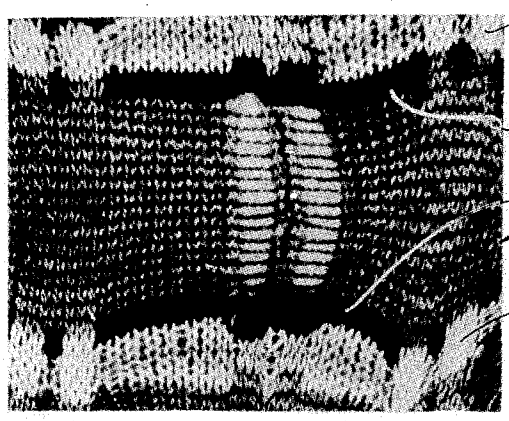


Fig. 13.

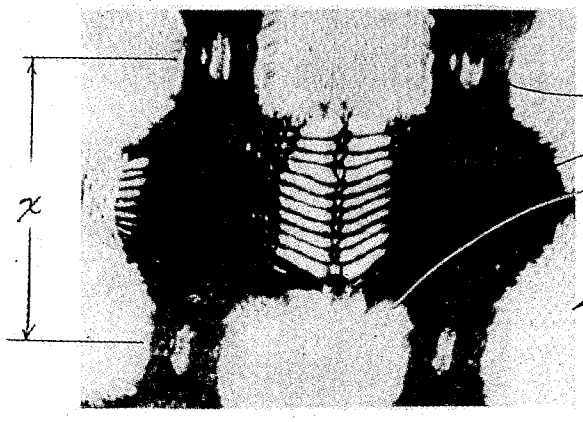


Fig. 14.

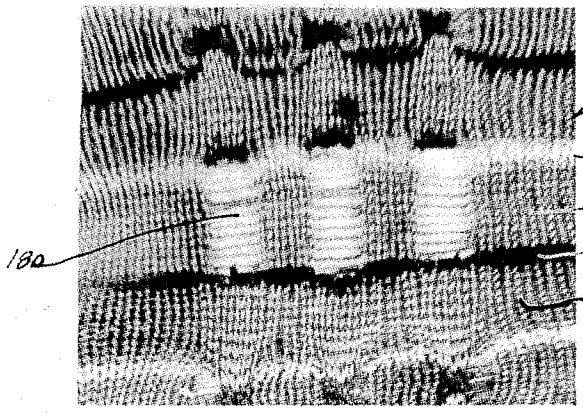


Fig. 15.

INVENTOR.
Clarence W. Minton.

BY Lancaster, Allwine and Rommel
ATTORNEYS.

Patented June 12, 1945 2,378,316

UNITED STATES PATENT OFFICE

2,378,316

MACHINE FOR PRODUCING KNITTED FABRIC

Clarence W. Minton, Nashville, Tenn., assignor to Hold Stitch Fabric Machine Company, Nashville, Tenn., a corporation of Tennessee

Application August 12, 1942, Serial No. 454,596

13 Claims. (Cl. 66—50)

This invention relates to improvements in seamless knitted stockings; particularly in a machine for the knitting of the same.

The primary object of this invention is the provision of an improved machine for the knitting of generally such type of fabric as set forth in my co-pending application Serial Number 416,746 filed October 27, 1941, wherein wale lines in certain areas of the fabric are knitted of a less length than adjacent wale lines whereby to produce a novelty effect

A further object of this invention is the provision of a machine for the knitting of fabric wherein certain wale lines are produced of stitches which tend to pucker the fabric in adjacent wale areas; this effect being produced by holding certain stitches upon the needles of the knitting machine while continuing the knitting of the tubular fabric for a predetermined number of courses and floating the yarn from these courses behind the needles whereon the stitches are being held, and then subsequently resuming knitting upon the needles whereon the stitches were first held, for the purpose of producing pleasing designs and effects in the fabric.

Other objects and advantages of this invention will be apparent during the course of the following detailed description.

In the accompanying drawings forming a part of this specification, and wherein similar reference characters designate corresponding parts thruout the several views,

Figure 1 is a front elevation of the improved knitting machine.

Figure 2 is a left handed side elevation of the improved knitting machine.

Figure 3 is a fragmentary right handed side elevation of the improved knitting machine.

Figure 4 is a plan view, partly in section, of the improved knitting machine, showing the operating mechanism.

Figure 5 is a developed view of the needle and jack arrangement of the knitting machine.

Figure 6 is a fragmentary rear elevation of the knitting machine.

Figure 7 is an enlarged view of a jack actuating cam block mechanism.

Figure 8 shows the actuating mechanism for a jack plunger cam control drum.

Figure 9 shows a different position of the mechanism of Figure 8.

Figure 10 is a view showing a section of the improved fabric knitted after the general method to be hereinafter described, and wherein at certain areas the wale lines have been shortened to pull out of normal alignment horizontal striped effects so as to present pleasing design effects in the fabric.

Figure 11 is a side elevation of a section of the specific type of fabric knitted upon the set-up of the machine herein described.

Figure 12 is a side elevation of a section of a third type of fabric knitted in accordance with this invention.

Figure 13 is an enlarged fragmentary view of a portion of the fabric shown in Figure 10 with certain wale lines cut away at the location where the normal horizontal striped effects are pulled out of line, in order to disclose the location at which the yarn is floated rearwardly of such cut wale lines.

Figure 14 is a view similar to Figure 13, but showing certain characteristic features of the type of fabric of Figure 11.

Figure 15 is likewise a view similar to Figure 13, but showing certain characteristic features in the structure of the fabric of Figure 12.

In the drawings, wherein for the purpose of illustration is shown only a preferred embodiment of the invention, the letter A may generally designate the improved knitting machine which may include a frame structure B, cylinder C, means D to operate the cylinder; a set of needles E and a set of jacks F. The letters H, K and L respectively designate the characteristic fabrics of Figures 10, 11 and 12, but it is to be understood that a wide variety of designs of fabric may be knitted upon the improved machine.

The knitting machine generally partakes of certain characteristics of the Banner type of knitting machine disclosed in U. S. Patent 933,443. It is to be understood, however, that the features of this invention are applicable to any type of circular knitting machine.

The frame B has a supporting bed 20 upon which the cylinder C is rotatably mounted in well known manner. Means for rotating and oscillating the cylinder C are of any approved type and will not be described herein, other than to refer to them as the means D. This means D includes as one of the parts thereof a conventional "104" gear designated at 23 in Figure 2 of the drawings and elsewhere.

The machine furthermore includes a shaft 24 having right and left drums K' and L' thereon for controlling certain levers to be subsequently described. At the rear of the machine there is provided a conventional shaft 26 which has a horizontal striper drum M thereon for a purpose to be subsequently described.

Upon the bed 20 of the machine there is disposed a plunger cam block 30 having a plurality of plunger cams 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, and 42 therein adapted to operate upon the butts of the set of jacks F, at different levels, for performing certain operations, to be subsequently described in detailing the cycle of operation of the improved machine.

The cams 31–42 are provided with individual springs 43 normally urging the cams inward into butt obstruction with the jacks, These plunger cams 31–42 are actuated by means of individual levers 44 pivoted upon a supporting post 45 by a shaft 46. This is shown in Figure 4 of the drawings. There the levers 44 are shown as having reduced ends operating in sockets 47 of the individual plunger cams. The levers 44 are controlled off of an intermittently operated drum 47 rotatably mounted upon shaft 48. The levers 44 may be moved for withdrawing the plungers 31–42 against their normal spring action so that they will be out of the path of the jack butts. In Figure 4 it is shown that the levers 44 are provided with end extensions 49 adapted to be engaged by certain detachable projections or pins or other means 50 placed upon the drum 47 in a selected arrangement. It is to be noted that the drum 47 is provided with these pins in position to only operate two of the jack plunger cams. The drum may be provided with any suitable means, such as screw threaded openings for receiving the detachable lever operating studs or pins 50 in any position around the circumference thereof for each one of the cam plunger operating members 44.

The means for intermittent rotation of the drum 47 is shown in Figures 4, 8 and 9 of the drawings. This drum is provided with a ratchet 55 controlled by means of a pawl 56 pivoted at 57 upon a lever extension 60. The latter is mounted upon a disc 61 oscillatable upon the shaft 48 as an axis. A spring 62 normally holds the pawl in position to engage the teeth of the ratchet wheel 55, as shown in Figure 9 of the drawings. The extension 60 has a connecting rod 63 which is pivoted at 64, as shown in Figures 3 and 4 of the drawings, upon the upper end of a lever 65. The latter is pivoted at 66 upon the frame of the machine and is in position to be operated by means of lugs 67 positioned upon the "104" wheel 23. The lugs 67 for this particular set-up, are positioned at 180° apart upon the wheel 23, so that the drum 47 is advanced two tooth notches of the pawl wheel for each full rotation of "104" wheel 23. Inasmuch as the "104" wheel rotates once for each four revolutions of the knitting machine cylinder, as is well known to those skilled in the art to which this invention relates, it can readily be understood that the drum will move one notch for each two knitted courses.

The means for throwing the pawl 56 out of action consists of a cam extension 70 mounted upon a disc 71 freely rotatable upon the shaft of the drum. This disc 71 has a connecting rod 72, shown in Figures 3 and 4 of the drawings, pivoted at its rear end at 73 to a bell crank lever 74. The latter is pivoted upon the shaft 66 above described, and the bell crank lever is operated by means of a connecting rod 77 off of a lever 78. The latter is pivoted at 79 and operated by a cam arrangement upon the drum K'.

As shown in Figures 1 and 4 of the drawings, screws 80 are provided on the post 45 on which the levers 44 are mounted, for each one of these levers, for the purpose of blocking out any of the individual cams 31–42.

In addition, means is provided for simultaneously throwing the entire set of cams in the block 30 out of action. This means consists of a lever 82 pivoted at the bottom of the post 45, upon the pin 46 having its forward end extending laterally of the levers 44 and there provided with a vertically disposed rod or member 85, shown best in Figures 4 and 7 of the drawings. The rod 85 is supported at its upper end upon a lever 86 pivoted upon the pin 46. Movement of the lever 82 will move the rod 85 against the forward ends of the levers 44 and by pressing thereagainst the cams 31–42 not already blocked out by the screws 80 can be thrown out of action. The lever 82 has a connecting rod 89, shown best in Figures 2 and 4 of the drawings pivoted rearwardly upon a bell crank lever 90. The latter is pivoted at 91 and its opposite end has a connecting rod 92 pivoted upon the rear end of a lever 93. The latter is mounted upon a shaft 94 and controlled off of the cam drum L', in a manner which is perfectly apparent. It is entirely possible to recess some of the levers 44 where the rod 85 operates thereagainst, so that certain of these levers 44 will not be affected by throwing out of the other levers thru operation of the lever 82.

It is contemplated that certain of the levers 44 need not be operated off of the drum 47. To that end certain of these levers 44 may have extensions 95, as shown in Figure 4 to which rods or wires 96 may be connected. The latter at their rear ends may be pivoted to certain bell crank levers 97. These bell crank levers may be mounted upon a block at an axis 99 and they are operated by means of rods 100 pivoted upon certain fingers 101, shown in Figures 2 and 4 of the drawings. These fingers or members 101 are operated off of the horizontal striper drum M above mentioned.

Certain others of the levers 44 are adapted to be operated off of the cam drum K' at the right hand side of the machine. To that end, such levers 44 as are operated off of the drum K', may be provided with pivoted lever extensions 105. They have connecting rods 107, as shown in Figure 4 of the drawings, pivoted in turn to the upper ends of certain bell crank levers 109, shown best in Figure 3 of the drawings. The opposite ends of such bell crank levers 109 are connected by means of rods 110 with certain levers 111 pivoted on the shaft 79 and operating off of the drum K'.

The knitting machine may be provided with a conventional main yarn feeding set-up and also an auxiliary yarn feeding set-up for the purpose of accomplishing different varieties of work. In the particular example of this application, the main feed knitting station may be provided with one or more yarn feed fingers 120 and 120a, shown in Figure 5 of the drawings, and at the auxiliary feed station one or more yarn feed fingers 121 may be provided. This yarn feed finger 121 may be used for feeding Lastex to the needles.

At the auxiliary feeding station of the knitting machine, as shown in Figures 2, 4 and 5 of the drawings, a cam plunger block 123 is provided, having plunger cams 124 and 125 slidably mounted therein and normally spring urged at 126, as shown in Figure 4 of the drawings, into butt actuating position with the jacks of the cylinder. Levers 127 are pivoted at 128 upon the machine and by means of rods 129 operated off of certain

levers 130 pivoted on the pin 94, and operating off of the drum L' above described.

While the machine of the present application has been shown as set up for the knitting of the type of fabric K shown in Figures 11 and 14, it is to be understood that thru different cam and lever control pattern set-ups, the machine may knit many other types of novelty seamless fabric than that disclosed at H, K and L.

The cycle of operation will be described in connection with the novelty pattern K shown in Figures 11 and 14. In this connection it should be borne in mind that the principal features of the method consist in feeding a yarn to predetermined groups of needles of the knitting machine for a predetermined number of courses; then holding said yarn upon the needles and upon other groups of needles feeding another yarn, preferably of contrasting color, for a predetermined number of courses; then resuming feeding of the first mentioned yarn in certain areas while holding the second yarn upon needles upon which previously fed, and continuing the knitting in this fashion. The means for holding the stitches and manipulating the needles and stitches is such, that the stitches in certain areas and upon certain needles will be drawn rather long so that when knitting is resumed certain stitches in the wale lines will be drawn out of proportion and thus produce a puckered effect at the areas behind which the yarns are floated as aforesaid.

The set of needles E is of course divided into a set of long butt needles and a set of short butt needles. The butts shown in black are the long butts. The usual cam set-up is provided except insofar as modified in the showing of Figure 5. For the purpose of this invention a hold stitch cam 140 is provided for lowering the needles to a low point so that the stitches will be hung over the top of the cylinder and during the holding of the stitches when knitting is performed upon certain needles the stitches will be lengthened in the wale lines. The cams 141 and 142 operate together off conventional operating mechanism 191a shown in Figure 1 of the drawings. The cams in the block 30 of course elevate the jacks and by reason thereof the proper needles for taking the desired yarn. The stitch cam 143 of course lowers these needles in conventional manner.

For the knitting of the fabric K shown in Figures 11 and 14 of the drawings, the cams 33, 35 and 37 are used. The cam 33 operates upon the butts 136 in certain groups of jacks shown in Figure 5, for elevating the needles thereabove; the cam 35 operates upon the groups of butts 137 for elevating the needles thereabove, and the cam 37, which is held contantly in place during knitting of the leg, by its spring, operates upon typical groups of butts 138 for elevating the needles thereabove.

In the fabric K shown in Figures 11 and 14, let us say that the white and brown yarns are alternately fed to the needles which take said yarn for sixteen courses each. The pattern set-up is such that at all times during knitting of the leg where the novelty effect is to be produced the cam 37 will remain in to engage the butts 138 for elevating the jacks and the needles thereabove. The areas designated at 150 in Figure 11 of the drawings, designate the wale lines which are knitted upon the needles above the jacks having the butts 136 which are adapted to be engaged by the cam 33. Assuming the white yarn 135 to be feeding yarn to the needles, the cams 33 and 37 will be in place and elevate all of the needles above the jack butts 136 and 138. During this knitting the needles above the jacks having groups of butts 137 will be out of action and holding the yarn stitches which have previously been lowered by the hold stitch cam 140. The white yarn is fed for sixteen courses to these needles above the jack groups 136 and 138 and this yarn is floated behind the needles above the group of jack butts 137 and of course this together with the fact that the hold stitch cam 140 had lowered the stitches over the top of the cylinder sufficiently, imposes a strain upon these stitches and causes them to lengthen at this location which is designated at the brown yarn areas 152 in Figure 11 of the drawings. After the sixteen courses have been knitted, the cam 33 is withdrawn and the cam 35 goes into action upon the butts 137. The cam 37 remains in place to still elevate the needles above the jacks having butts 138. Of course the mechanism for the yarn feed fingers 120—120a goes into action and throws the white yarn finger 120 out of place and the brown yarn finger 120a into action for feeding the brown yarn to these needles. The action has thus been reversed with respect to the groups of needles actuated off of the cam plungers 33 and 35 and the white yarn is now held upon the needles above the jacks having butts 136 and for sixteen courses the brown yarn is fed to the needles above the jacks having butts 137—138. By reason of the strain imposed upon the stitches incident to the floating of the brown yarn back of the needles upon which the white yarn is held and also because of the strain imposed upon the stitches by reason of the lowering of the needles by the hold stitch cam 140 over the top of the cylinder, the white yarn stitches will be lengthened at the areas indicated at 150 in Figure 11 of the drawings. This produces the novelty puckered effect in the fabric, since the stitches in the wale lines at the areas 150 and 152 are rendered taut. It is obvious under such circumstances that the entire sixteen course float portions of one yarn float back of the other yarns knitted at these areas 150 and 152, as the case may be, and become puckered due to the tautness of the stitches at these areas 150—152. The length of the sixteen courses, walewise is indicated at "X" in Figure 14 of the drawings.

In Figures 1 and 4 of the drawings the lugs 50 operate upon the lever 44 controlling the cam plunger 33 and the lugs 50a operate on the lever 44 controlling the cam plunger 35. Obviously any pattern set-up may be arranged for the knitting of any desired number of courses with each of the brown or white yarns.

Referring to the fabric H shown in Figures 10 and 13, it will be noted that the same presents diamond-shaped designs. This is given to the fabric because of the shortened wale lines at the locations 160 and 160a, pulling the normally horizontal striped courses out of horizontal alignment at these points. In the knitting of this particular design six courses of white yarn may be knitted at 162 and thereafter two courses of the red yarn designated at 163. Thereafter substantially all of the needles of the machine except those at the location 160 receive a blue yarn designated at 164 for a predetermined number of courses, say sixteen. The needles holding the red yarn at the area 160 will of course have been lowered by the hold stitch cam 140 and the stitches held thereon will be lengthened and rendered taut during the knitting of these sixteen blue courses. The blue yarn is floated rearwardly

of these lowered needles, and after the knitting of the sixteen courses additional stitches may be knitted in the wale lines at the areas 160, if desired, altho such is not necessary. The stitches will be lengthened, by reason of being tautly drawn during the knitting of the blue stitches and the fact that the hold stitch cam has exceptionally lowered these stitches on the cylinder. Regular knitting may then be resumed upon the needles of the machine, providing a two-course red yarn at 166 and a subsequent six course white yarn designated at 167. It will be noted that the white yarn stripes and red yarn stripes which would ordinarily be horizontal are thus drawn out of location to produce the diamond effect shown in the fabric of Figure 10.

In Figure 13 it will be noted that certain stitches forming the wale lines at the areas 160 have been cut to expose the float portions of the blue yarn and to show how the white and red yarns will then be drawn out horizontally into normal position. For this fabric H it will be noted from Figure 10 that other shortened wale line areas 160a may be provided in the fabric, which in the fabric H is a blue yarn in duplication of the above described procedure while knitting sixteen courses of the blue yarn to provide the areas 167a. It will be noted that the fabric in the wale lines formed of the blue yarn adjacent the areas 160 and 160a will be puckered.

Referring to the type of fabric L shown in Figures 12 and 15 of the drawings, I knit two courses of a red yarn, shown at 170; ten courses of a blue yarn shown at 171 and then two courses of a white yarn shown at 172. At certain points the blue yarn is floated behind stitches of the red yarn held upon certain needles during the knitting of the ten courses of the blue yarn 171 and these stitches held upon these needles are lengthened by reason of being held stitches at such an area as designated at 173. This bulges the entire area of blue yarn 171 adjacent the hold stitch locations. The areas designated at 171a will have a normally flat appearance and the areas designated at 171 will of course bulge. This will also be the case at additional areas such as 171b. In Figure 15 the hold stitches at 173 have been severed to show that the yarn is floated at 180. This view also shows the red and white yarns 170 and 172 normally drawn out horizontally upon the severing of such hold stitches.

It is a matter of choice to produce puckered and striped effects, since the needle, jack and cam set-ups may be varied at will to provide different designs and patterns. Likewise, the number of courses of sitches in the pull wale line areas wherein the lengthened hold stitches may be varied in number and length.

It is not necessary to knit the stocking out of a plurality of colors, since a solid colored yarn may be used thruout the stocking and the bulged and puckered effects still produced as herein described.

I prefer to knit a top or other portion of the fabric by feeding yarn to every needle of the machine and knitting it in the current course at one feed station (either main or auxiliary), and dropping the alternate or other recurrent needle stitches from the course being currently produced, at the other feed. This gives a top or other tubular fabric which is decorative, comfortable and elastic. It can serve as a top without the use of elastic yarn.

Wherever the terminology "floating the yarn back of needles at the hold stitch locations" or terminology of similar meaning is used, it is intended to broadly cover the floating of yarn at such locations, whether actually floated back of the needles or back of the axes of the needles extended, by reason of said needles being lowered.

Various changes in the steps of the method of producing the improved fabric and the designs selected, as well as in the arrangement of instrumentalities by which the fabric is formed, may be made to the invention as herein shown and described, without departing from the spirit of the invention or the scope of the claims.

I claim:

1. In a circular stocking knitting machine having a needle cylinder, a series of needles, a series of jacks therefor, means for dividing the needles into a plurality of recurrent groups, a main yarn feeding station for feeding a yarn to certain of said groups for a predetermined number of successive courses, means for feeding another yarn from said main yarn feeding station to other groups for a predetermined number of successive courses while holding the individual stitches of the first mentioned yarn on the first mentioned groups of needles which receive the first yarn and floating the second yarn back of the needles holding the stitches of the said first yarn, and means for reversing and repeating the cycle of feeding said yarn or yarns to said groups of needles.

2. In a circular knitting machine the combination of a cylinder, a set of needles therefor, a main yarn feeding station for feeding yarn to predetermined groups of needles and after the knitting of one or more courses upon said needles holding the stitches of said yarn thereon, means for thereafter feeding other yarn from said yarn feeding station to another group or groups of needles for a plurality of successive courses while holding the first mentioned yarn upon the needles of the first mentioned group and floating the second mentioned yarn back of the needles holding said first mentioned yarn, means for thereafter holding the second yarn on certain needles upon which stitches are provided and thereafter resuming knitting of the first yarn while floating the first yarn back of the needles holding the second yarn.

3. The method of knitting yarn in novelty effects upon a seamless stocking knitting machine having a plurality of independent needles which consists in selectively feeding yarn from a single yarn feed station to predetermined groups of recurrent needles for a predetermined number of successive courses, thereafter lowering said needles and feeding a second and contrasting yarn to other predetermined groups of recurrent needles while holding the stitches of the first mentioned yarn on the first mentioned groups and stretching the stitches thereof by floating the second yarn back of the needles holding said stitches, and repeating the cycle of knitting said yarns upon the said groups of needles above mentioned.

4. A circular stocking knitting machine comprising a rotary cylinder, a set of independent needles therefor, a set of independent jacks therefor, means for feeding a plurality of contrasting yarns to said needles at a main yarn feed station, stitch cam mechanism for knitting yarn upon said needles, a plurality of cams in advance of the stitch cam mechanism for actuating said jacks to selectively actuate said needles, pattern mechanism for selectively operating said jack cams, said jacks having butts thereon for dividing the needles into predetermined recurrent groups upon actuation by said jack actuating cams, pattern

means for feeding one yarn to certain of said groups of needles for the knitting of a predetermined number of courses, a hold stitch cam for lowering said needles after said predetermined number of courses for holding the stitches on the needles of the said groups, means thereafter for feeding another yarn to other groups of needles as determined by the selector cams.

5. In a machine for the knitting of seamless stockings, the combination of a set of independent needles, means to feed at a single feed station a plurality of contrasting yarns to said needles to knit fabric thereon, selective means for controlling certain selected needles at predetermined areas whereby to hold yarn stitches of at least one of said yarns while knitting upon the remaining needles for a predetermined number of successive courses, another contrasting yarn while floating the last mentioned yarn at the location of the needles upon which said stitches are being held, and means for subsequently resuming knitting upon all of said needles so that in the fabric adjacent the location of said held stitches the fabric will be puckered.

6. In a stocking knitting machine the combination of a circular line of independent needles, means for selectively manipulating said needles, means for feeding a plurality of yarns from a single feed station to said needles, means for feeding one of said yarns to certain successive needles in recurrent zones of the circular line of needles for a predetermined number of courses while floating the yarn at the other zones so that it will lie back of yarn subsequently knitted upon the needles of those zones at which said yarn is floated, and means for regulating the needles at said zones where the yarn is floated as aforesaid for the feeding of another yarn thereto and at the same time rendering inactive the needles at such zones which receive yarn as first mentioned whereby the second yarn is floated thereat, and repeating the feeding of said yarns as aforesaid.

7. In a stocking knitting machine the combination of a circular line of independent needles, means for manipulating said needles in selected groups for receiving yarn, a main feed station having means for feeding a plurality of regular stocking forming yarns to said needles, and means for regulating the feeding of said yarns to selected groups of needles whereby certain of said yarns knit wale lines thruout a greater number of courses than courses in which the other yarn or yarns form stitches with float portions of the first mentioned yarn floated back of the knitted portions of the other yarn or yarns whereby to produce puckered effects in the fabric.

8. In a circular knitting machine the combination of a circular line of independent needles, a main feed station having means for feeding a plurality of yarns to said needles, means for selectively manipulating the needles whereby at certain zones a yarn of one color is fed to said needles at said zones, means for lowering said needles to which the yarn has been fed at said zones, means to elevate the needles at other zones and feed a contrastingly colored yarn thereto which is floated at the zones at which the first yarn is fed so as to lie back of the finished fabric, and means for continuing the successive knitting of said yarns in selective arrangement to the selected needle zones in course regulated numbers whereby at least one of the yarns will be fed to its needles in a less number of courses than the other yarn so as to disturb the course color continuity of the knitting in the tubular fabric.

9. In a circular stocking knitting machine the combination of a circular line of independent needles, a single feed station for feeding a plurality of yarns to said needles, means for selectively manipulating certain groups of needles whereby at certain zones in the fabric being knitted one yarn is fed to said groups of needles at said zones, means for lowering said groups of needles aforesaid to which yarn has thus been fed and holding the yarn stitches thereon, means to subsequently feed yarn to other groups of needles for a plurality of courses and floating the same at the groups of needles which hold the stitches of the first yarn, and means for continuing and reversing the knitting of said yarns on said groups and the floating thereof where not knitted to provide a fabric having a puckered effect adjacent to the locations where said yarns are floated.

10. The method of knitting yarn in puckered novelty effects upon a seamless stocking knitting machine having a plurality of independent needles which consist in selectively feeding one yarn to predetermined groups of recurrent needles for a predetermined number of successive courses, thereafter holding said yarn stitches of said yarn on said needles and feeding the same yarn or a second yarn to other predetermined groups of recurrent needles for a predetermined number of courses producing tensioned wale lines of less length than the wale lines of the courses first knitted and floating said last mentioned yarn back of the stitches held upon the first mentioned groups of needles, and repeating and reversing the cycle of knitting said yarn or yarns upon said groups of needles whereby to provide puckered effects of the fabric adjacent to the locations where said yarns are floated.

11. The method of knitting a seamless stocking which consists in feeding yarn to the independent needles of a circular knitting machine, holding the fabric on certain adjacent needles at relatively spaced zones by rendering said needles inactive, feeding a second yarn to the intermediate needles between said zones and knitting the said second yarn upon said intermediate needles thruout a predetermined number of courses while floating the second yarn at the zones upon which the first yarn is being held upon the inactive needles and controlling the wale line lengths of the second yarn where knitted over floated portions of the first mentioned yarn, and thereafter resuming knitting of the yarns whereby the controlled wale line lengths over the floated portions of the first mentioned yarn will be tautly drawn and shorter than the adjacent wale line lengths whereby to forwardly pucker the fabric thereat.

12 The method of knitting seamless tubular stockings upon a circular knitting machine having independent needles which consists in feeding a yarn to the needles of the machine to provide a normally horizontal striped effect of the yarn, holding certain portions of the yarn upon certain needles rendered inactive and thereafter knitting an intermediate contrasting knitted area upon the independent active needles over a predetermined number of courses, and subsequently knitting wale lines of shorter length than the wale lines of the last mentioned yarn upon the inactive needles upon which the first mentioned yarn is being held whereby to draw what would be normal horizontal stripes out of the horizontal line.

13. In a circular stocking knitting machine the combination of a rotary cylinder, a set of independently operated needles mounted in the cylinder, a yarn feeding station, means for feeding a yarn therefrom to certain predetermined recurrent needles of a set of needles and knitting yarn thereon thruout one or more courses, means for thereafter lowering the said predetermined needles with the yarn stitches held thereon, means for thereafter feeding the same or other yarn from said yarn feeding station to other recurrent needles of the needle set while floating the said last mentioned yarn at the locations where the yarn first mentioned is held on the first mentioned predetermined needles and knitting said last mentioned yarn upon said other needles to provide wale lines of said yarn of different lengths than the adjacent wale line lengths of the first mentioned knitted yarn, and means for reversing and repeating the cycle of feeding the yarn or yarns aforesaid whereby to present in the fabric puckered effects adjacent to the yarn which provides the shorter wale line lengths.

CLARENCE W. MINTON.