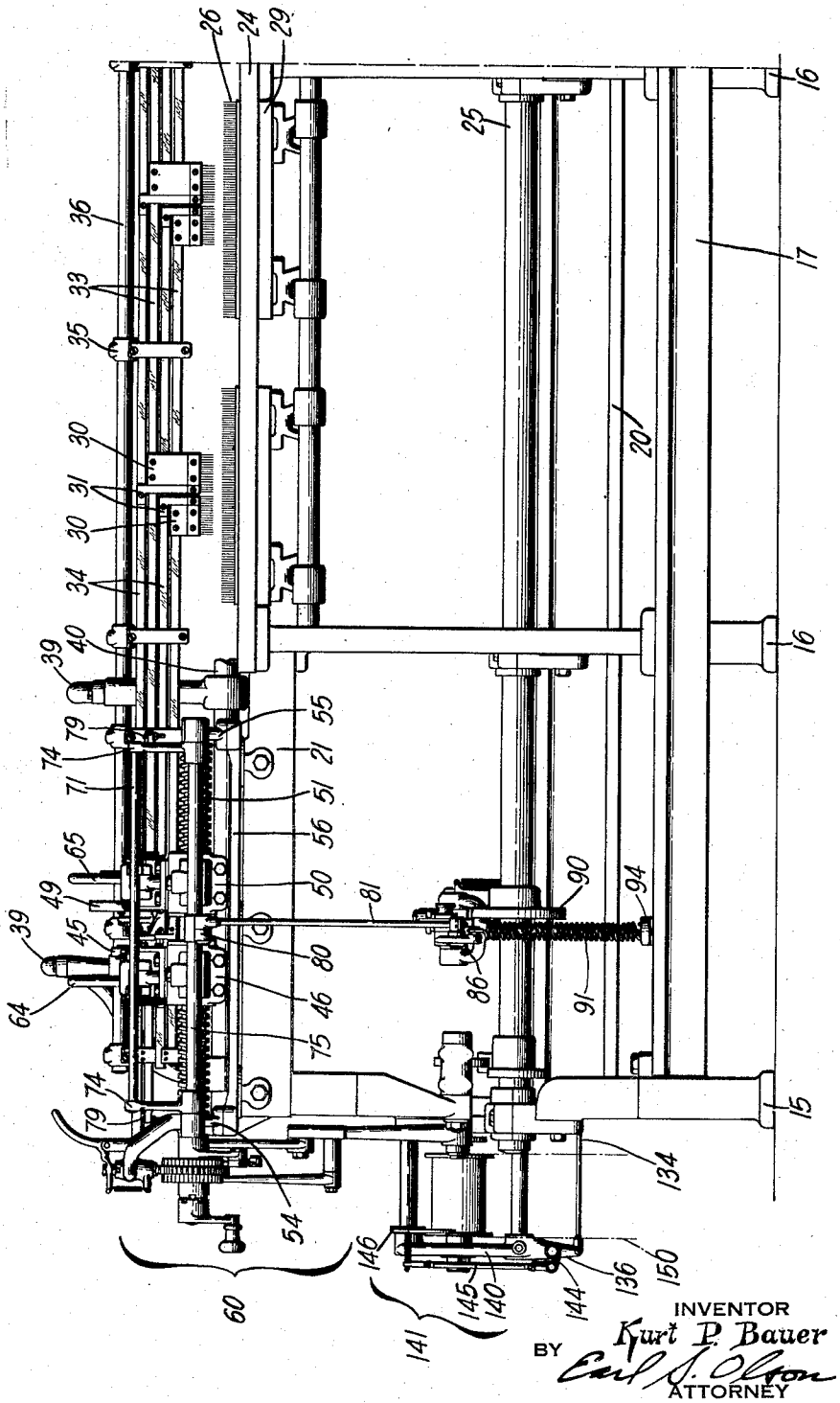
July 27, 1954 K. P. BAUER 2,684,582

NARROWING MECHANISM FOR STRAIGHT KNITTING MACHINES

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Fig. 1



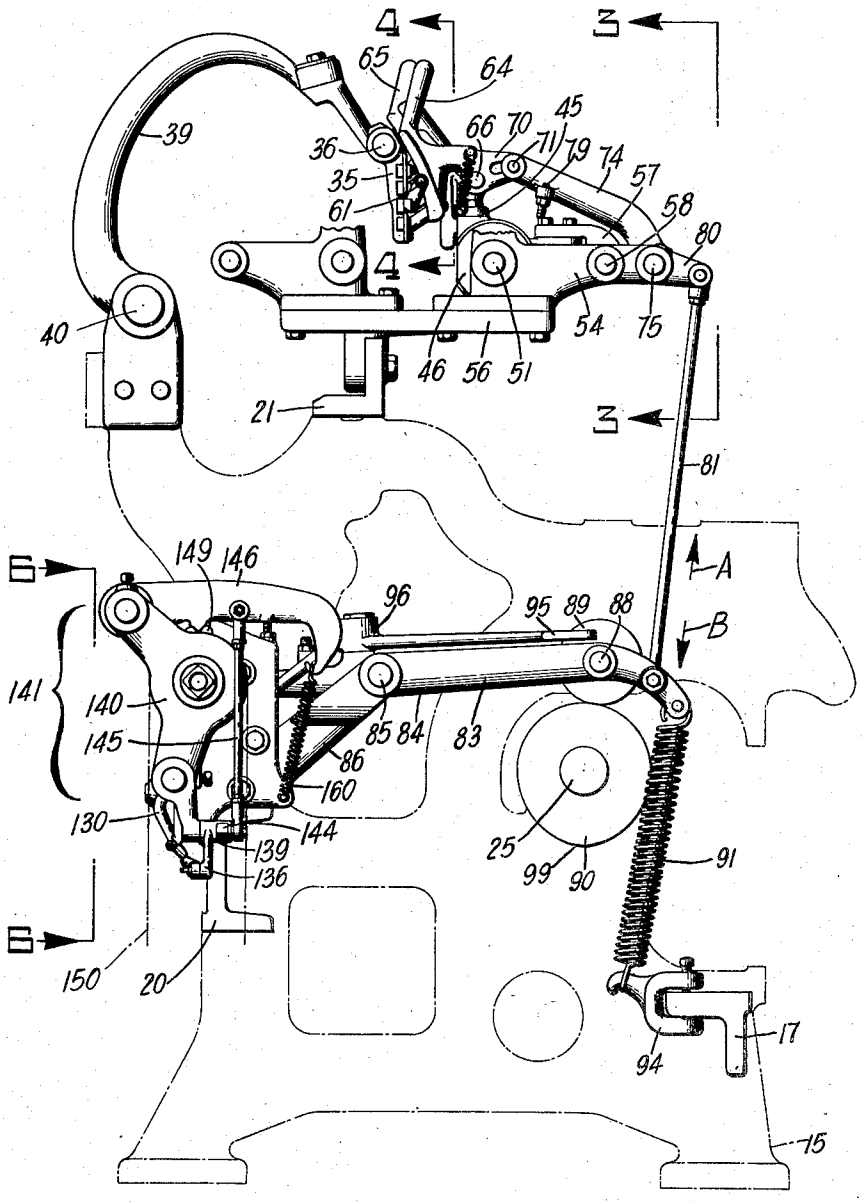
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NARROWING MECHANISM FOR STRAIGHT KNITTING MACHINES

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Fig. 2



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NARROWING MECHANISM FOR STRAIGHT KNITTING MACHINES

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Fig. 3.

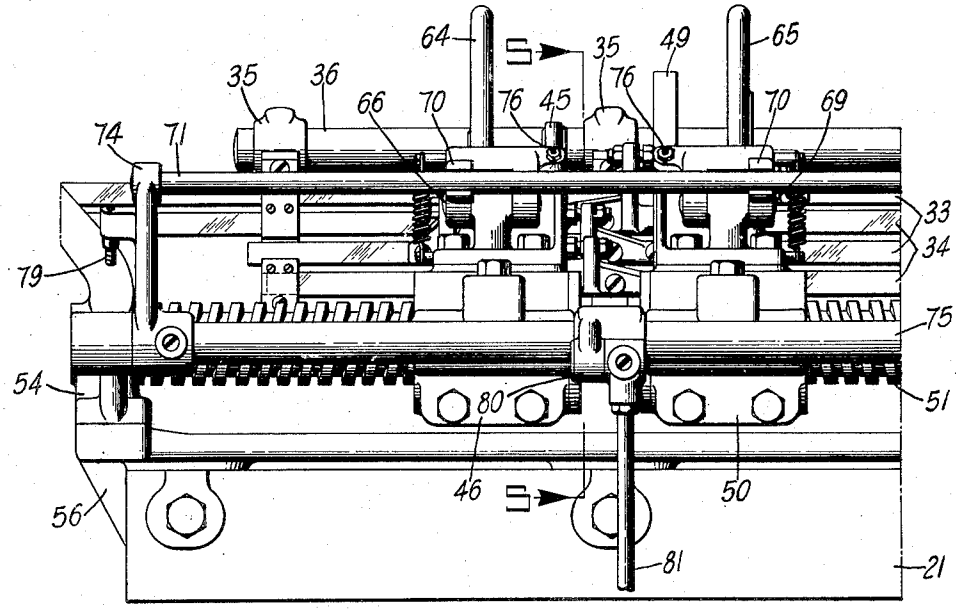


Fig. 4.

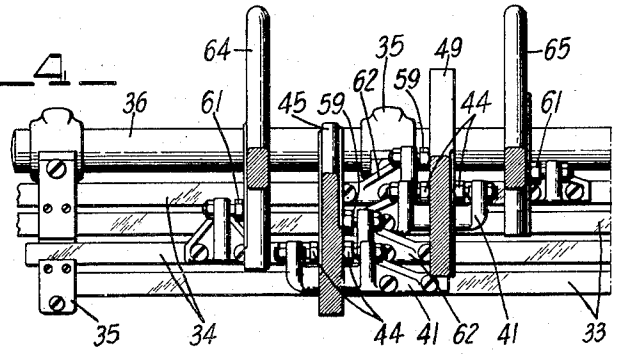
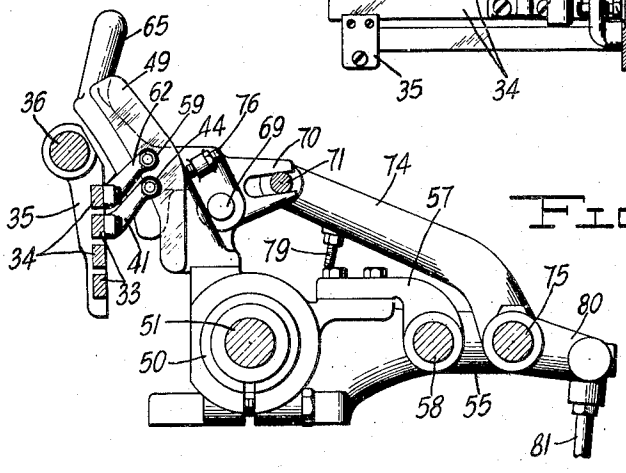


Fig. 5.



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NARROWING MECHANISM FOR STRAIGHT KNITTING MACHINES

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Fig. 6

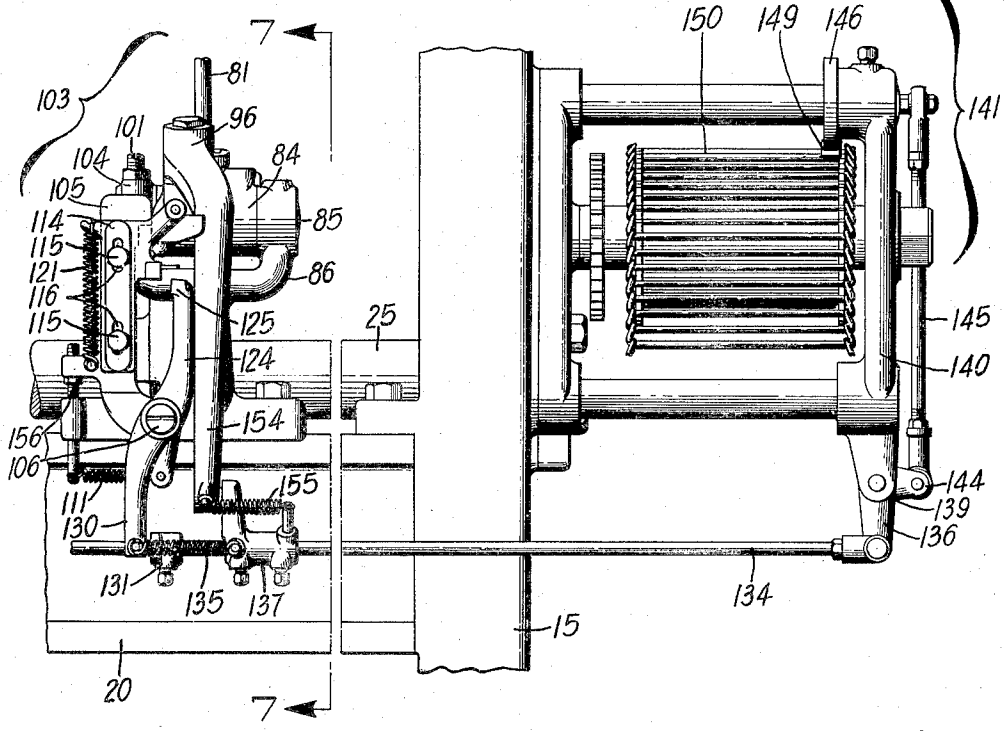
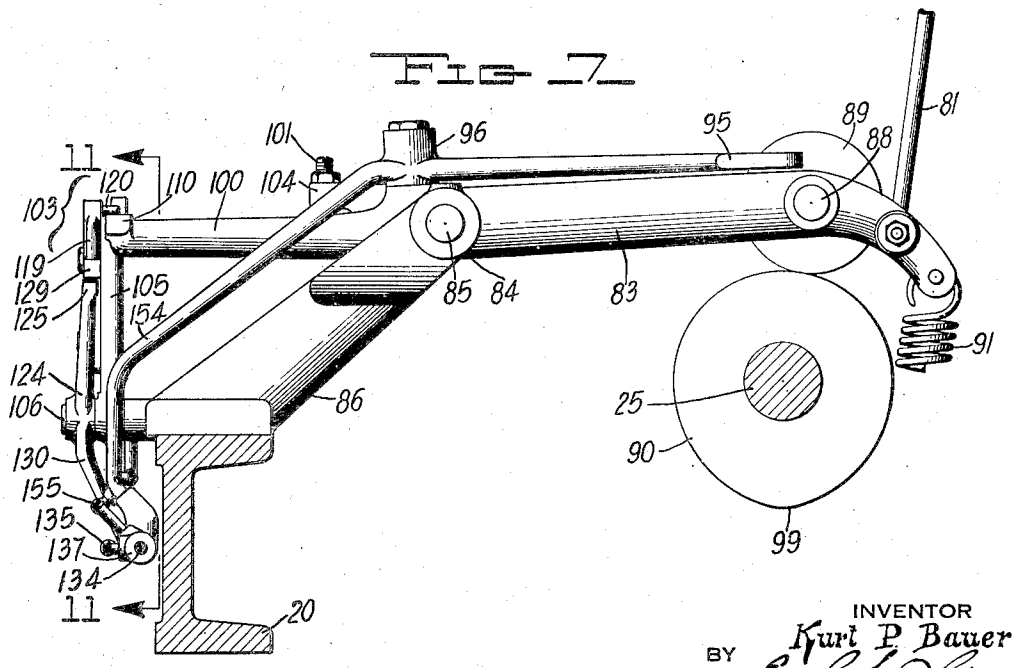


Fig. 7



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NARROWING MECHANISM FOR STRAIGHT KNITTING MACHINES

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Fig. 8

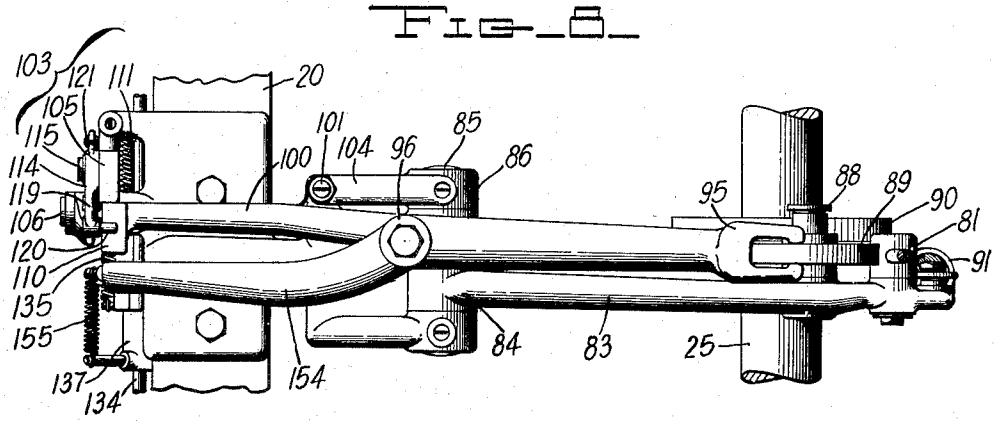


Fig. 9

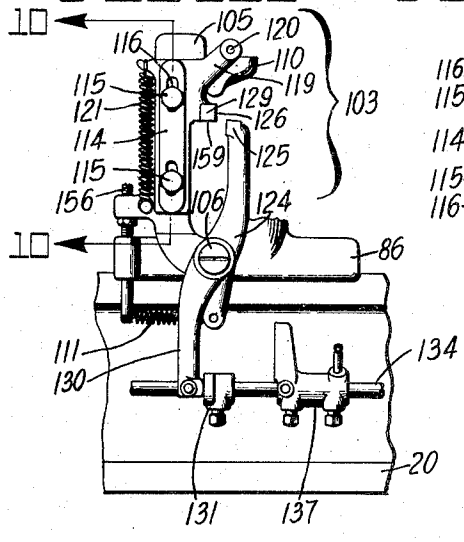


Fig. 10

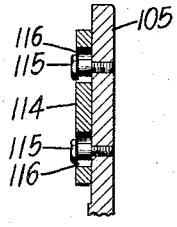


Fig. 11

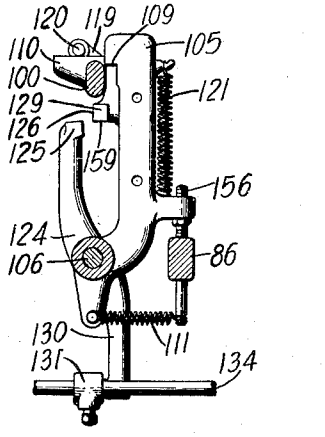


Fig. 12

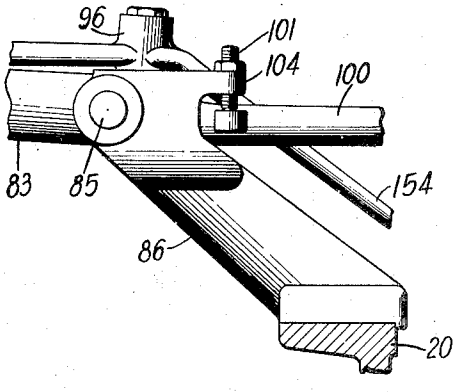
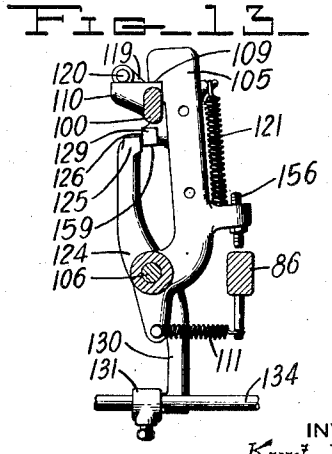


Fig. 13



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Patented July 27, 1954

2,684,582

UNITED STATES PATENT OFFICE

2,684,582

NARROWING MECHANISM FOR STRAIGHT KNITTING MACHINES

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Application September 10, 1952, Serial No. 308,775

9 Claims. (Cl. 66—89)

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This invention relates to improvements in full-fashioned knitting machines and more particularly to narrowing mechanism for such machines of the type having wide and narrow point combs.

In many multi-section full-fashioned knitting machines for producing complete stocking blanks, including the leg and foot portions, the machines are provided with the so-called footer type narrowing mechanism, having two sets of point combs, the first conventionally being wide and the second narrow. Conventionally in the use of this type of narrowing mechanism, only the first or wide combs are positively connected to the narrowing nuts for movement with them in opposite directions the second or narrow combs being connected to the nuts at times but only for movement in the narrowing direction. Thus in fashioning the leg, heel and sole portions only the wide combs of each pair are employed and the narrow combs are positioned adjacent to each other at the center of each section where the points of the combs are held inactive by a covering knife. At the start of the toe portion of the blanks, the narrow combs are moved manually to a position adjacent the wide combs and the wide and narrow combs are then operated in non-unison relation to form the diamond point narrowings the narrow combs being moved only in the narrowing direction by the nuts.

There is now a trend to form an additional toe tip portion in the stocking blanks, following the diamond point narrowings, in which the fabric edges are narrowed substantially to a point whereby the toe looping operation may be eliminated. In this top tip portion, the narrowing marks are formed along lines converging with each other and with the selvage edges of the tip portion. To cause the toe tip narrowings to converge with the selvage edges, both the wide and narrow point combs must be employed as a unit at each side of the knitting section, the combs at opposite sides of the section being given a movement toward each other to narrow the tip portion and an idle movement away from each other to position the combs for a subsequent narrowing movement. Therefore, for this operation the narrow point combs must be positively connected to move with the nuts in both directions.

Also in forming stockings having lace or non-run loop formations, the reinforced portions of the stockings are usually of plain fabric and the edges of the reinforced portions are fashioned at the same time that the lace or non-run loop portions are being formed. It is desirable that

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the fashioning be performed by stitch transfer but this requires that the narrow combs be used which in turn again requires that they move with the nuts in both directions.

A principal object of the instant invention is the provision of improved means for automatically connecting the narrow and wide combs for unison operation when required in the above mentioned and other situations and for non-unison operation in other cases.

Heretofore, mechanisms have been provided to positively connect the narrow combs to the narrowing nuts to operate in unison with the wide point combs and to disconnect the narrow combs from the wide combs for non-unison operation. However, certain of such mechanisms operated to release the narrow combs only after the narrowing combs, nuts and a control mechanism carried on the nuts, were moved to predetermined positions in a cycle of operation. In another device, the release means was in a fixed position making it necessary to move the nuts and point combs to said fixed position to permit the release means to function to disconnect the wide combs from the nuts whereby only the narrow combs continued to function to fashion the fabric. Also, each of the prior devices was constructed and arranged to function for one specific purpose and then only when in one predetermined position.

It is therefore another object of the invention to provide means for overcoming the above mentioned and other objections to the mechanism heretofore preposed for controlling the operation of the wide and narrow point combs during the fashioning of stocking blanks.

A still further object of the invention is to provide a full-fashioned knitting machine with means for connecting the narrow point combs to and disconnecting them from the comb operating means in any position of the comb operating means during fashioning operations of the machine.

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

In the drawings:

Figure 1 is a front elevational view of a portion of the left end of a full-fashioned knitting

machine having mechanism according to the invention incorporated therein;

Fig. 2 is an end elevational view as seen from the left of Fig. 1 and enlarged relative to Fig. 1, certain parts being omitted and others broken away in order to more clearly illustrate the invention;

Fig. 3 is an elevational view of the mechanism looking in the direction of the arrows 3—3 of Fig. 2;

Fig. 4 is a sectional view taken substantially along the line 4—4 of Fig. 2;

Fig. 5 is a sectional view taken substantially along the line 5—5 of Fig. 3;

Fig. 6 is an elevational view taken in the direction of the arrows 6—6 of Fig. 2;

Fig. 7 is a sectional view taken substantially on the line 7—7 of Fig. 6;

Fig. 8 is a plan view of the mechanism shown in Fig. 7;

Fig. 9 is a detail view similar to a portion of Fig. 6, certain of the parts being omitted;

Fig. 10 is a sectional view taken substantially on the line 10—10 of Fig. 9;

Fig. 11 is a sectional view taken substantially on the line 11—11 of Fig. 7;

Fig. 12 is a detailed elevational view looking from the left of Fig. 6; and

Fig. 13 is a view similar to Fig. 11 but with the parts shown in different relative positions.

In the drawings and description, only the means necessary to a complete understanding of the invention are specifically set forth; further information as to the construction and operation of other related, usual and well known knitting machine elements, mechanisms, etc., may be found in one or more of the following publications of the Textile Machine Works, Reading, Pa.: The "Reading" Full-Fashioned Knitting Machine Parts Catalog, published in 1940, the supplement thereto entitled The "Reading" High Production Full-Fashioned Knitting Machine, published in 1940, and The "Reading" Full-Fashioned Knitting Machine Parts Catalog published in 1947.

The mechanism shown in the drawings comprises a portion of a full-fashioned knitting machine in which the novel features of the invention have been incorporated. The mechanism includes a needle bar for each section of the machine, rods having wide and narrow point combs, a rod having a wide comb and a rod having a narrow comb acting at times as a pair at each end of each needle bar, a narrowing head having a nut positively connected to each of the rods for the wide combs and means for locking the rods for the narrow combs to the nuts whereby the nuts operate the pairs of wide and narrow combs as a unit. The locking means is operated from a cam on the camshaft of the machine, the operation of which is controlled by an auxiliary pattern device.

In the drawings and more particularly in Figs. 1 and 2, there is shown a portion of the left end of a multi-section full-fashioned knitting machine including an end frame 15, center frames 16, a front beam 17, a back beam 20, a center bed 21, and a front bed 24, the beams and beds connecting the end and center frames in spaced relation along the length of the machine. The machine is provided with a camshaft 25 having cams (not shown) for operating needles 26 carried in needle bars 29, one for each knitting section of the machine. Cooperating with the needles 26 in forming stocking fabrics are yarn carriers for

laying yarn and sinkers and dividers (not shown) for forming the yarn into loops on the needles in the usual manner. Also cooperating with the needles to fashion the stocking fabrics is a narrowing mechanism including wide and narrow point combs 30 and 31, pairs of the wide and narrow combs being provided for each side of each knitting section, carried on rods 33 and 34, respectively, slidably mounted in brackets 35. The brackets 35 are carried on a front narrowing shaft 36 supported by arms 39 fixed to a back narrowing shaft 40 (Fig. 2) which is pivotally mounted in the end frames 15 and center frames 16.

The rods 33 for the left and right wide combs 30 are provided with brackets 41 having adjustable bolts 44 engaging opposite faces of a bracket 45 fixed to a left nut 46 and a bracket 49 fixed to a right nut 50, respectively as shown in Figs. 3, 4 and 5. The nuts 46 and 50 are mounted on oppositely threaded portions of a spindle 51 carried in bearing members 54 and 55 which are supported by a base member 56 fixed on the center bed 21. Arms 57, slidably mounted on a rod 58 carried in the brackets 54 and 55, are connected to the nuts 46 and 50 to prevent rotative movement of the nuts relative to the spindle 51. The rods 34 for the left and right narrow point combs 31 carry brackets 62 having adjustable stop screws 59 for engagement with the facing surfaces of the brackets 45 and 49 of left and right nuts 46 and 50, respectively. With this arrangement in each section the wide combs 30 are positively moved toward and away from each other and the narrow combs 31 are only moved toward each other or in the narrowing direction.

In the usual practice, the wide combs 30 are operated by the spindle 51 by means of an actuating mechanism 60 to narrow or widen the fashioned portions of the stocking blanks to the start of the toe while the narrow combs are inactively positioned at the center of the blanks. At the start of the toe of the blanks, the narrow combs are moved outwardly to within a one needle distance from the wide combs and the wide and narrow combs, then acting in pairs, are operated to form the diamond toe narrowings. During the first portion of the diamond toe narrowings, the wide combs 30 are moved a two needle distance in the narrowing direction and the narrow combs 31, being spaced a one needle distance from the wide combs, are moved one needle, thereby forming two adjacent fashion marks separated by the width of the narrow point combs. After each narrowing operation the wide combs are moved outwardly a one needle distance and the narrow combs remain stationary, which again spaces the wide combs a one needle distance from the narrow combs. After a predetermined number of narrowing operations to form parallel rows of fashion marks in the upper portion of the diamond narrowings, the rows of marks are brought to a point. To effect this result the wide combs continue to move a two needle distance and the narrow combs are moved a one needle distance in the narrowing direction. Immediately following each narrowing operation in the latter group, the wide and narrow combs are idly moved a further one needle distance in the narrowing direction and then the wide combs are idly moved outwardly a one needle distance to again separate the wide and narrow combs by a distance of one needle.

The operating steps for the wide and narrow combs 30 and 31, respectively, to form the diamond toe narrowings as explained above, forms

no part of the present invention and is therefore only briefly described herein. Also, the mechanism for operating the wide and narrow combs as set forth is not a part of the invention and hence, is only diagrammatically shown at 60 in Fig. 1. A more detailed description of the operating steps and means for performing such steps are to be found in the pending patent application of Christian F. Schlemmer, Serial No. 255,199, filed November 7, 1951.

In knitting stocking blanks according to the present trend in which the toe looping operation is omitted, immediately following the formation of the last diamond toe narrowings, additional narrowings are formed to bring the fabric edges of the toe substantially to a point. The rows or lines of fashion marks are also caused to converge substantially to a point and toward the selvage edges of the blanks. In order to form the converging fashion marks, the narrow combs 31 must be employed and the combs moved a distance of two needles in the narrowing direction and an idle one needle distance in the outward direction. However, as hereinbefore set forth, the rods 34 carrying the narrow point combs 31 are conventionally connected to the nuts 46 and 50 to move only in the narrowing direction and means must therefore be provided to connect or lock the rods 34 to the nuts to positively move the narrow point combs in opposite directions.

In accordance with the instant invention the means for locking the rods 34 for the narrow combs 31 to the nuts 46 and 50, respectively, includes the stop screws 59 one of which is carried on the rod for the left narrow point combs 31 and which is adapted to engage the bracket 45 on the nut 46. The other stop screw 59 is carried on the rod for the right narrow point combs 31 and engages the bracket 49 on the nut 50. The rod 34 for the left narrow point comb 31 carries a second stop screw 61 for engagement with a lever 64 when the stop screw 59 on the rod is in engagement with the bracket 45 on the nut 46. Likewise, the rod 34 for the right narrow point comb 31 carries one of the stop screws 61 for engagement with a lever 65 when the stop screw 59 on the rod is in engagement with the bracket 49 on the nut 50 (Fig. 4). The lever 64 is pivotally carried on a shaft 66 fixed in the bracket 45 (Figs. 2 and 3) and the lever 65 is pivotally carried on a shaft 69 fixed in the bracket 49 (Figs. 3 and 5). Each of the levers 64 and 65 are provided with a forked portion 70 for engagement with a rod 71 mounted in arms 74 fixed to a shaft 75. The shaft 75 is pivotally mounted in the bearing members 54 and 55 (Figs. 1 and 5).

To move the levers 64 and 65 into locking engagement with the rods 34 for the left and right narrow point combs 31, respectively, the arms 74 are turned clockwise about the axis of the shaft 75 and through the connection between the rod 71 and forked portions 70, the levers 64 and 65 are moved counterclockwise into engagement with the stop screws 61 on the rods 34. The levers 64 and 65 are provided with adjustable screws 76 which are adapted to engage the brackets 45 and 49, respectively, to limit the counterclockwise movement of the levers (Figs. 3 and 5). The arms 74 are also provided with adjustable stop screws 79 which are adapted to engage the bearing members 54 and 55 to limit the counterclockwise movement of the arms (Figs. 1, 2 and 3).

The shaft 75 is turned to move the arms 74 clockwise to lock the narrow point comb rods 34 to the nuts 46 and 50 by means of an arm 80 fixed to the shaft. The arm 80 has one end of a rod 81 pivotally connected thereto, the other end of the rod being pivotally connected to one arm 83 of a lever 84. The lever 84 is pivotally mounted on a pin 85 fixed in a bracket 86 secured to the back beam 20 and the arm 83 has a pin 88 which rotatably carries a cam follower 89 adapted to cooperate with a cam 90 on the camshaft 25 of the machine. The follower 89 is biased toward the cam 90 by means of a spring 91 connected between the arm 83 and a bracket 94 secured to the front beam 17 (Figs. 1 and 2). The follower 89 is also movable axially on the pin 88 from a normally inactive position out of the path of the cam 90 into the path of the cam, as hereinafter set forth, by means of a forked end 95 of a follower shifting lever 96 pivotally mounted on the arm 83 (Figs. 7 and 8).

The arm 83 of lever 84 has two operating positions, a high position which is determined by engagement of the follower 89 with a high portion 99 of the cam 90 and a low position which is determined by the engagement of a second arm 100 of the lever 84 with a set screw 101 adjustably carried in an arm 104 of the bracket 86 (Figs. 8 and 12). In moving to its high position, the arm 83 moves the rod 81 in the direction indicated by an arrow A (Fig. 2) to turn the arms 74 counterclockwise and the levers 64 and 65 clockwise (Fig. 5) to disengage the stop screws 61 on the rods 34 for the left and right narrow point combs 31, respectively. In moving to its low position, the arm 83, moves the rod 81 in the direction indicated by an arrow B (Fig. 2) to turn the arms 74 clockwise and the levers 64 and 65 counterclockwise into engagement with the stop screws 61 on the narrow point comb rods 34 when the stop screws 59 for such rods are in engagement with the brackets 45 and 49 on the nuts 46 and 50, respectively.

The arm 83 of the lever 84 is normally maintained in its high position throughout the formation of a stocking blank to the start of the series of narrowing operations, following the diamond toe narrowings, to bring the tip of the toe substantially to a point. For maintaining the arm 83 in the high position, a control means 103 is provided including a latch lever 105 pivotally mounted on a stud 106 carried in the bracket 86. The lever 105 has a lip portion 109 adapted to overlie and engage a flat end portion 110 of the arm 100 of the lever 84 and a spring 111, connected to the lever 105 and the bracket 86 (Figs. 9 and 11), tends to bias the lip portion into such engagement with the arm. The lever 105 carries a member 114 by means of headed studs 115, the studs engaging in slots 116 (Figs. 9 and 10) in the member to guide said member for movement relative to the lever. The member 114 is provided with a projecting portion 119 having a pin 120 fixed therein which is normally held in engagement with the flat end portion 110 of the arm 100, as shown in Figs. 7, 9 and 11, by a spring 121 connected between the member and the lever 105.

As hereinbefore set forth, the arm 83 of the lever 84 is normally latched in its high position by engagement of the lip 109 of the lever 105 with the flat end portion 110 of the arm 100 of the lever 84 (Fig. 13), the lever 105 being held in the latched position by the spring 111. When it is desired to move the levers 64 and 65 into locking relation with the narrow point comb rods 34, the latch lever 105 must be moved out of

engagement with the end portion 110. With the lever 84 released from the lever 105 and with the follower 89 shifted into alignment with the cam 90 by the forked lever 96, the follower rides from the high to the low portion of the cam thereby causing the levers 64 and 65 to engage and lock the narrow point comb rods 34 to the nuts 46 and 50.

The means for moving the latch lever 105 out of engagement with the lever 84 includes a lever 124 one end 125 of which is adapted to engage a side edge 126 of a portion 129 of the member 114 (Fig. 13) when the lever 124 is turned in a counterclockwise direction as viewed in Fig. 9 or in a clockwise direction as viewed in Figs. 11 and 13. The lever 124 has a lower arm 130 which engages a dog 131 fixed on a rod 134. The arm 130 is held in engagement with the dog by means of a spring 135 connected between the arm and a second dog 137 fixed to the rod 134 (Fig. 6). The rod 134 is connected to one arm 136 of a bell crank lever 139 pivotally mounted on a frame member 140 forming a part of a pattern means 141. A second arm 144 of the bell crank lever 139 is connected by means of a link 145 to a pivoted pattern lever 146 which is adapted to be engaged by buttons 149 on a chain 150 (Figs. 2 and 6) also forming part of the pattern means 141. Also carried on the rod 134, as hereinbefore set forth, is the dog 137 adapted to engage a depending arm 154 of the lever 96 for shifting the cam follower 89. A spring 155, connected between the arm 154 and dog 137, normally maintains engagement between the arm and dog but is arranged to permit disengagement at times as hereinafter set forth. The pattern means 141 forms no part of the present invention and is only shown in sufficient detail to explain how the means 103 is set into operation to control the locking of the narrow point comb rods 34 to the nuts 46 and 50.

With the lip 109 of the latch lever 105 in engagement with the end 110 of the lever 84 (Fig. 13), in which position the arm 83 of the lever 84 and the cam follower is in the high position, a button 149 is moved beneath the pattern lever 146 of the pattern means 141 to turn the lever 139 counterclockwise as viewed in Fig. 6. Counterclockwise movement of the lever 139 moves the rod 134 and the dog 137 to the right and the spring 155 connected to the dog also moves the arm 154 to the right (Fig. 6). Movement of the arm 154 to the right turns the lever 96 counterclockwise about its pivot, as viewed in Fig. 8, to shift the cam follower 89 into alignment with the cam 90. Movement of the rod 134 to the right as viewed in Fig. 9 or to the left as viewed in Figs. 11 and 13 also moves the dog 131 in the same direction and carries the spring 135 to move the end 125 of lever 124 into engagement with the side edge or face 126 of member 114 and turn lever 105 to disengage the lip 109 from the end 110 of the lever 84. The extent of movement of the lever 105 to disengage the lever 84 is controlled by engagement of an adjustable screw 156 carried in the lever 105, against the bracket 86 (Figs. 9, 11 and 13). With the lever 84 released from the latch lever 105 and the follower 89 aligned with the cam 90, as the follower 89 moves from the high portion 99 toward the low portion of the cam, the lever 84 is turned clockwise, as viewed in Fig. 7, the arms 74 are turned clockwise and the levers 64 and 65 are moved counterclockwise into engagement with the stop screws 61 thereby locking

the narrow point comb rods 34 to the nuts 46 and 50, respectively.

The lever 84 turns clockwise until the arm 100 engages the set screw 101, the end portion 110 of the lever 84 rising above the lip 109 of the latch lever 105, as shown in Fig. 11. Following locking of the rods 34 to the nuts 46 and 50 the button 149 is moved out of engagement with the pattern lever 146 and a spring 160 connected to the lever 146 biases the lever toward the chain thereby turning lever 139 clockwise and moving the rod 134 to the left as viewed in Fig. 6. Movement of the rod 134 to the left returns the lever 124 to the position of Figs. 9 and 11 and the lever 96 to the position of Figs. 6 and 8 through the dogs 131 and 137, respectively. Also, as the end portion 110 rises the member 114 is raised, against the action of the spring 121, to move a bottom edge 159 of the portion 129 of the member above the end 125 of the lever 124 for the purpose hereinafter set forth.

When it is desired to release the rods 34 for the narrow point combs 31 from the nuts 46 and 50, to permit non-unison operation of the wide and narrow point combs, as in the diamond point toe, another button 149 on the chain 150 is moved into engagement with the lever 146 thereby shifting rod 134 to the right as viewed in Figs. 6 and 9. Movement of the rod 134 to the right tensions spring 155 so that when permitted the follower 89 is again shifted into alignment with the low part of the cam 90 by the forked end 95 of the lever 96 and the lever 124 is moved counterclockwise thereby moving the end 125 of the lever 124 beneath the bottom edge 159 of the portion 129. As the follower 89 rides from the low portion to the high portion 99 of the cam 90, the lever 84 is turned counterclockwise and the member 114 engages and is supported by the lever 124 thereby breaking the engagement between the pin 120 in the member and end 110 of the lever 84. With the parts so positioned, as the lever 84 reaches the end of its counterclockwise movement, the spring 111 turns the lever 105 clockwise, as viewed in Fig. 9, or counterclockwise, as viewed in Fig. 11, to again move the lip 109 of the lever 105 into latching engagement with the end 110 of the lever 84 (Fig. 13). When the button 149 is disengaged from the pattern lever 146 the rod 134 is again shifted to the left (Figs. 6 and 9) to turn the lever 96 to move the follower 89 out of alignment with the cam 90 and to move the end 125 out of engagement with the member 114. The spring 121 thereupon draws member 114 downwardly until the pin 120 is in engagement with the end 110 and the edge 126 is again in position to be engaged by the end 125 of the lever 124 when another button 149 is moved into engagement with the lever 146.

It will be obvious from the foregoing that the rods 34 of the narrow point combs 31 may be positively engaged to the nuts 46 and 50 to operate the narrow combs in unison with the wide point combs 30 whenever the stop screws 61 on the rods are in engagement with the brackets 45 and 49 of the nuts. Also, whenever desired, the rods 34 for the narrow point combs 31 may be released from positive engagement with the nuts and operate in a non-unison manner to form the diamond toe narrowings or the narrow combs may be idly positioned at the center of the needle bars 29 while the wide combs 30 fashion the fabric, as hereinbefore set forth. Further, one operation of the pattern means 141 causes the control means 103 to lock the narrow point comb rods 34

to the nuts 46 and 50 and a similar operation of the pattern means causes the control means to function to release the narrow point comb rods from the nuts.

The invention has been described in connection with the formation of stockings having conventional leg and foot fashionings and in which the selvage edges of the toe tip are brought substantially to a point thereby eliminating the usual toe loopings. However, the invention is also applicable where the wide and narrow combs operate as a single comb in the reinforced heel and sole portions of lace and non-run stockings and where the toes are fashioned as hereinbefore set forth. In the latter form of stockings, buttons 149 on the chain 150 control the operation of the mechanism to lock the rods for the narrow point combs to the nuts to fashion the heel and sole portions of the stockings, to release the rods from the nuts to form the diamond toe narrowings, to again lock the rods to the nuts to narrow the toe tip and to again release the rods from the nuts for the start of the next stocking blanks.

Of course, the improvements specifically shown and described by which I obtain the above results, can be changed and modified in various ways without departing from the invention herein disclosed and hereinafter claimed.

I claim:

1. In a knitting machine having a camshaft and narrowing mechanism including first and second point combs, rods for the combs, a spindle having reversely threaded portions, nuts on said spindle, means for connecting said first combs to said nuts for movement in widening and narrowing directions, in combination with means for locking the rods for said second point combs to said nuts for positive movement in the widening and narrowing directions including a lever pivoted on each of said nuts, cam means on said camshaft for connecting said levers to and disconnecting them from said rods in any operating position of said nuts and means for controlling the operation of said cam means.

2. In a full-fashioned knitting machine having narrowing mechanism for fashioning fabric knitted on the machine, said narrowing mechanism including a first and a second point comb operating at each selvage edge of said fabric, a rod on which each of said combs is mounted, a spindle having reversely threaded portions, nuts on said spindle, and means for positively connecting the rods for said first point combs to the nuts for movement in opposite directions, and means for moving the rods for said second point combs only in the narrowing direction, in combination with means on said nuts for positively connecting the rods for said second point combs to said nuts, means for operating said connecting means and pattern means for controlling said operating means.

3. In a full-fashioned knitting machine having mechanism for fashioning stocking fabric knitted on said machine including first and second point combs operating at opposite selvage edges of said blanks, a rod for each of said combs, a spindle having reversely threaded portions, nuts on said spindle, means for connecting the rods for said first point combs to said nuts for movement in opposite directions, means for moving the rods for said second point combs in the narrowing direction, means on the nuts for locking said rods for said second point combs to said nuts for movement in opposite directions and for releasing said rods from said nuts, cam means for operating said locking and releasing means and control means for said cam means for determining the locking and releasing positions of said means on said nuts.

4. A straight knitting machine having mechanism for fashioning stocking fabric knitted on said machine including first and second point combs adapted to operate along each selvage edge of the fabric, a rod for each of said combs, a spindle having reversely threaded portions, nuts on said spindle, the rods for said first combs being connected to said nuts for movement in opposite directions and the rods for said second combs being connected to the nuts for movement only in the narrowing direction in combination with means on said nuts for connecting the rods for said second combs to said nuts for movement in opposite directions and for releasing said rods from said nuts, cam means for operating said connecting means and control means for said cam means including a latch member for maintaining said connecting means in released position.

5. In a knitting machine having mechanism for fashioning stocking fabric knitted on said machine including wide and narrow point combs adapted to operate at each selvage edge of the fabric, a rod for each of said point combs, a threaded spindle having reversely threaded portions, nuts on said spindle, means for connecting the rods for the wide point combs to said nuts for movement in opposite directions, and connections between the rods for the narrow point combs and the nuts for moving said rods only in the narrowing direction, in combination with means for connecting the rods for the narrow point combs to the nuts for movement in opposite directions including a lever pivoted on each of said nuts, and means common to both of the levers for operating said levers in any operating position of the nuts on said spindle.

6. In a straight knitting machine having a camshaft and mechanism operated by said camshaft for fashioning stocking fabric knitted on said machine including wide and narrow point combs adapted to operate at each selvage edge of the fabric, a rod for each of said combs, a spindle having reversely threaded portions, nuts on said spindle, means for connecting the rods for the wide combs to said nuts for movement in opposite directions, means for connecting the rods for the narrow combs to said nuts for movement only in the narrowing direction, means pivotally mounted on said nuts for connecting the rods for the narrow combs to said nuts for movement in opposite directions and for releasing said rods from said nuts, a cam on said camshaft, connections between said cam and pivoted means, means for latching said connections and pivoted means in released position, and pattern means for operating said latching means for releasing said connections to operate said pivoted means to connect said rods for the narrow combs to said nuts.

7. In a straight knitting machine having a camshaft and mechanism operated by said camshaft for fashioning stocking fabric knitted on said machine including wide and narrow point combs adapted to operate at each selvage edge of the fabric, a rod for each of said combs, a spindle having reversely threaded portions, nuts on said spindle, means for connecting the rods for the wide point combs to said nuts for movement in opposite directions, and means for connecting the rods for the narrow point combs to said nuts

for movement only in the narrowing direction, in combination with means for connecting the rods for the narrow combs to said nuts for movement in opposite directions including a lever pivoted on each of the nuts, a cam on said camshaft, a cam lever, a follower carried on said cam lever and shiftable thereon into and out of the path of said cam, and means adapted to transmit an impulse from said cam lever to said levers on said nuts to move said levers into and out of engagement with said rods for said narrow point combs.

8. In a knitting machine having a camshaft and mechanism operated by said camshaft for fashioning stocking fabric knitted on said machine, including wide and narrow point combs adapted to operate at each selvage edge of the fabric, a rod for each of said combs, a spindle having reversely threaded portions, nuts on said spindle, means for connecting the rods for the wide point combs to said nuts for movement in opposite directions, and connections between the rods for the narrow point combs and the nuts for moving said rods only in the narrowing direction, in combination with means including said connections for connecting the rods for the narrow point combs to the nuts for movement in opposite directions with the rods for the wide point combs, a lever pivoted on each of said nuts, means common to and adapted to engage both of said levers in any position of the nuts on said spindle, and means operated from said camshaft for actuating said common means to connect the rods for the

narrow point combs to and to disconnect them from said nuts.

9. In a knitting machine having a camshaft and mechanism operated by said camshaft for fashioning stocking fabric knitted on said machine including wide and narrow point combs adapted to operate at each selvage edge of the fabric, a rod for each of said point combs, a spindle having reversely threaded portions, nuts on said spindle, means for connecting the rods for the wide point combs to said nuts for movement in opposite directions, and connections between the rods for the narrow point combs and the nuts for moving said rods only in the narrowing direction, in combination with means including said connections for positively connecting the rods for the narrow point combs to the nuts for movement in opposite directions with the rods for the wide point combs, a lever pivoted on each of said nuts, means common to and adapted to engage both of said levers in any position of the nuts on said spindle, cam means, means connecting said common means and operated by said cam means to connect the rods for the narrow combs to and to disconnect them from said nuts, and pattern means for controlling the operation of said cam means.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
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