Dec. 9, 1947. E. M. ZESCH 2,432,108

HEEL FASHIONING MECHANISM FOR STRAIGHT KNITTING MACHINES

Filed July 28, 1945 12 Sheets-Sheet 1

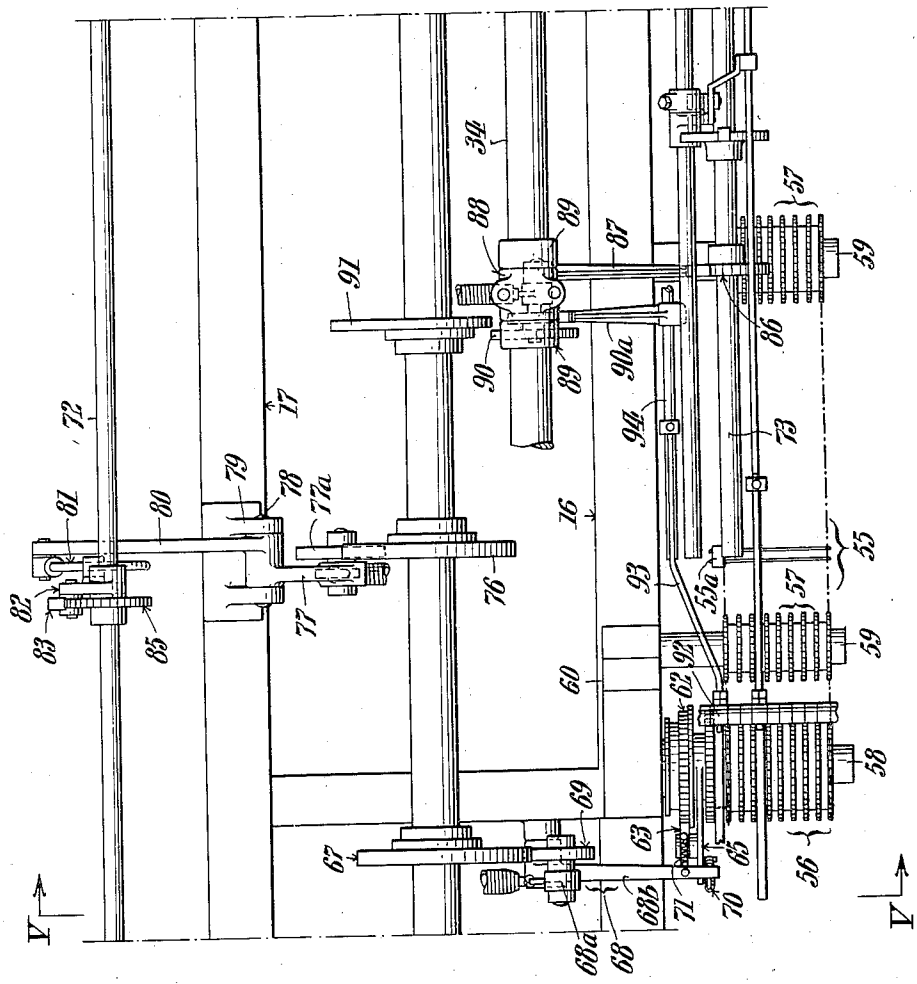


FIG. 1.

WITNESSES

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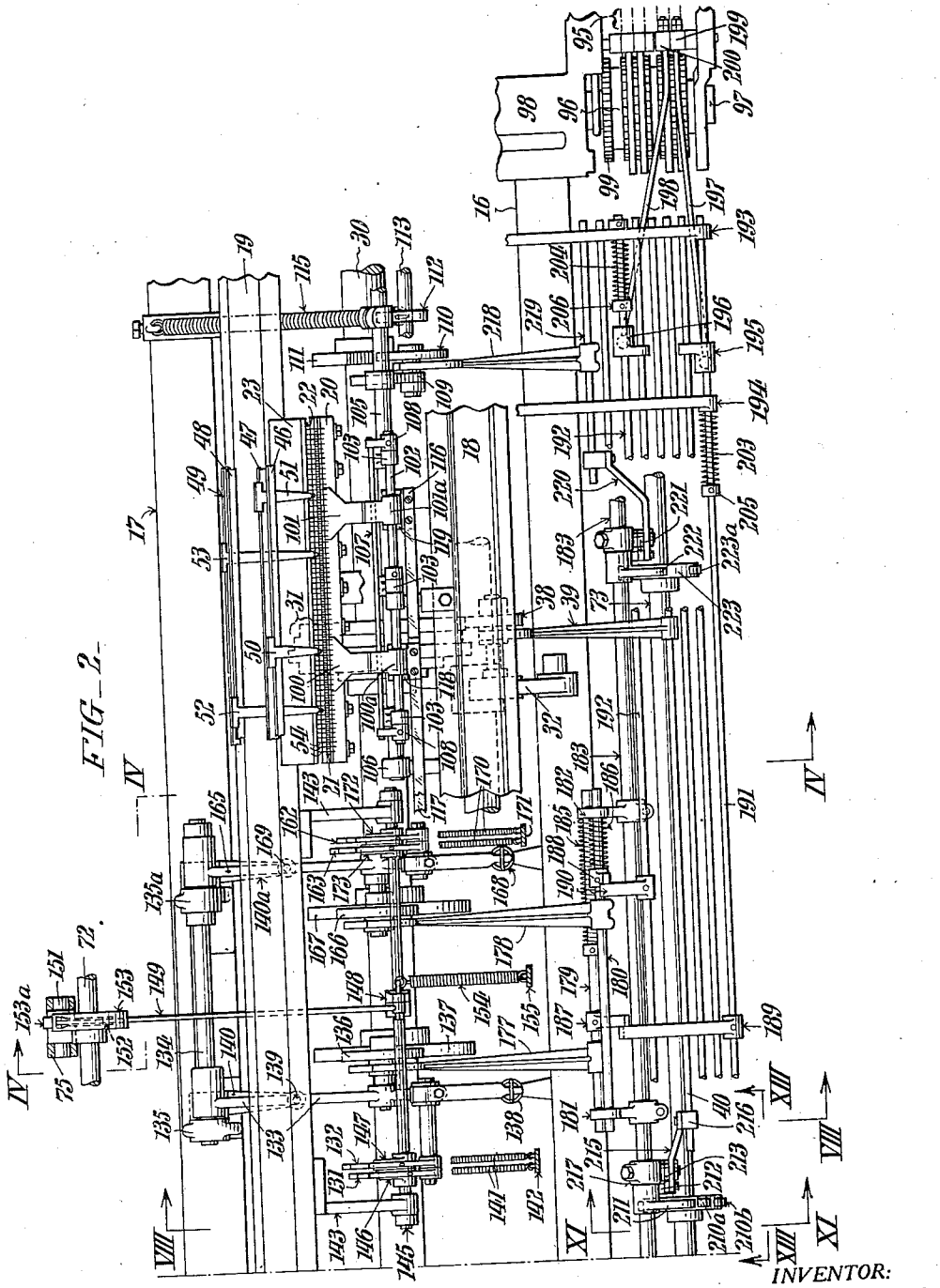
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HEEL FASHIONING MECHANISM FOR STRAIGHT KNITTING MACHINES

Filed July 28, 1945 12 Sheets-Sheet 2

FIG. 2.



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HEEL FASHIONING MECHANISM FOR STRAIGHT KNITTING MACHINES

Filed July 28, 1945 12 Sheets-Sheet 3

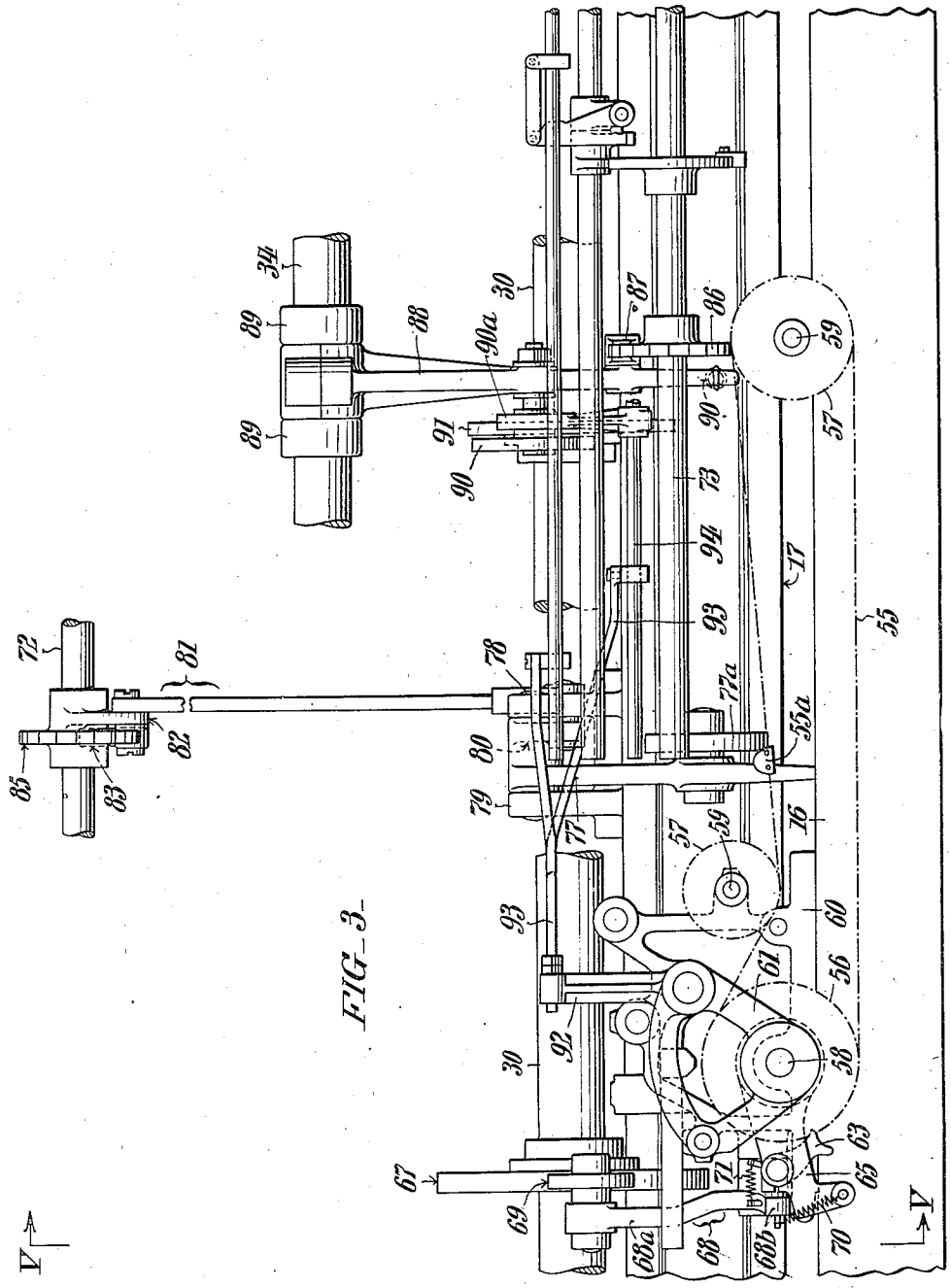


FIG. 3.

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HEEL FASHIONING MECHANISM FOR STRAIGHT KNITTING MACHINES

Filed July 28, 1945 12 Sheets-Sheet 4

FIG. 4.

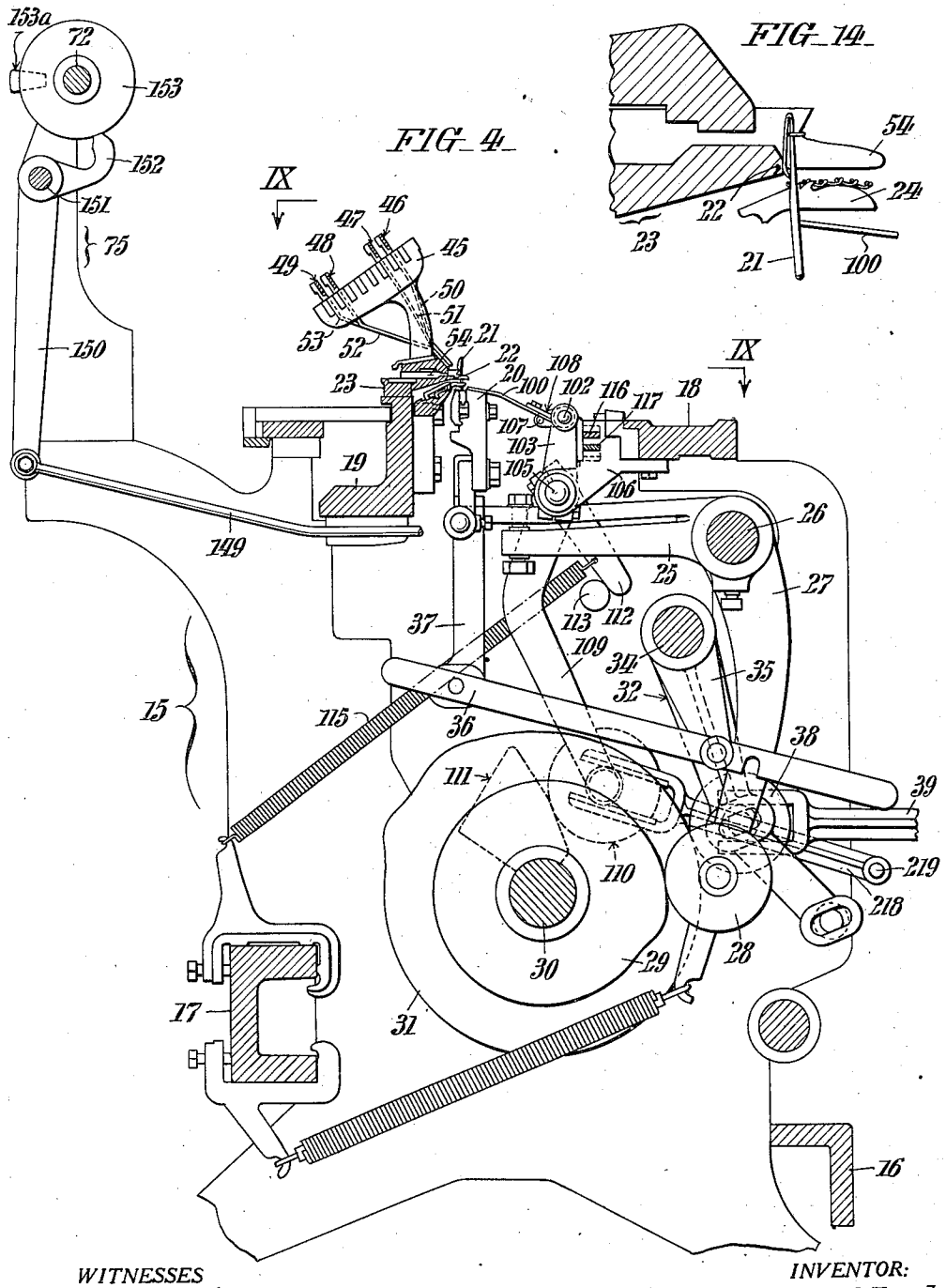


FIG. 14.

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HEEL FASHIONING MECHANISM FOR STRAIGHT KNITTING MACHINES

Filed July 28, 1945 12 Sheets-Sheet 5

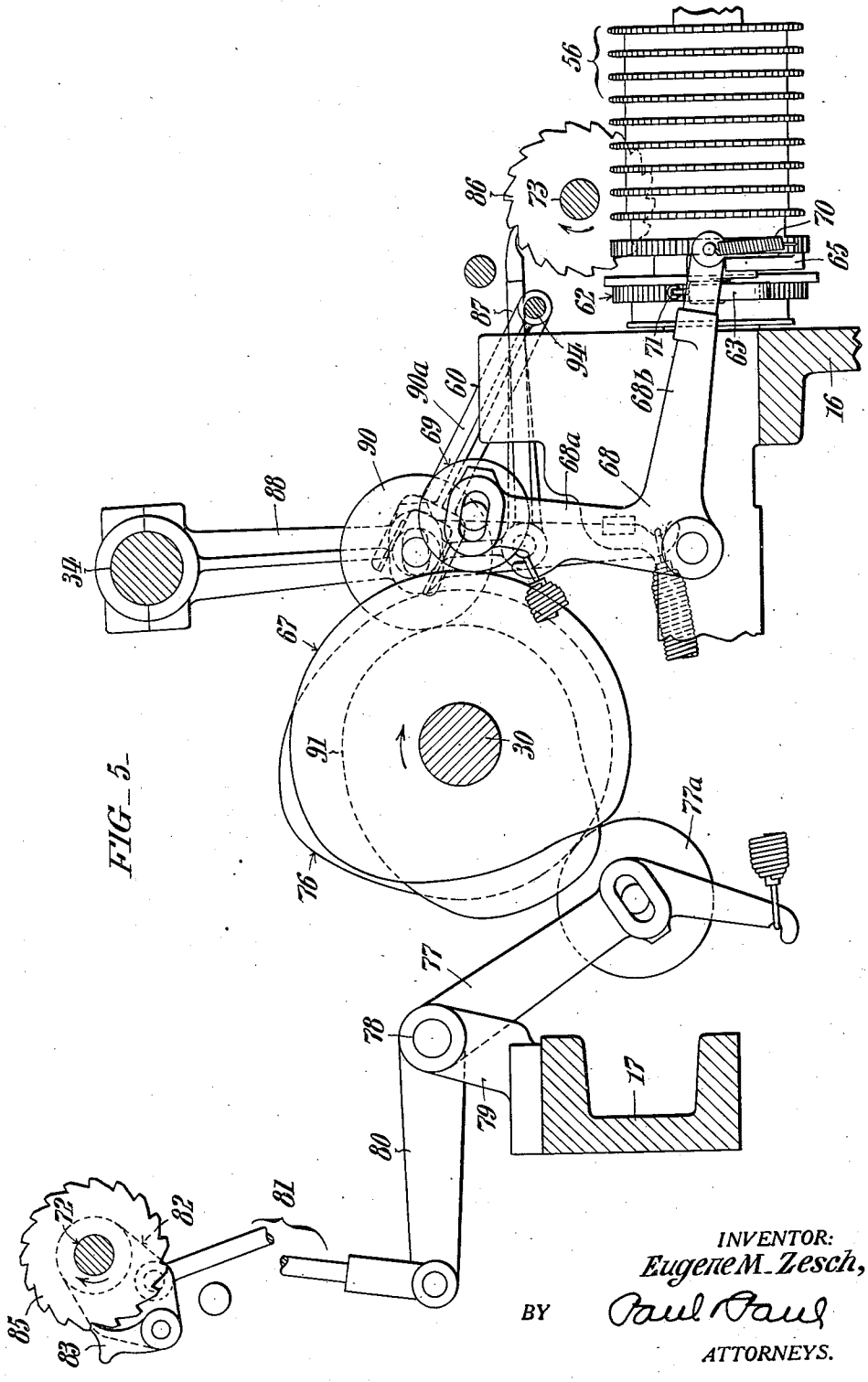


FIG. 5.

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Dec. 9, 1947. E. M. ZESCH 2,432,108

HEEL FASHIONING MECHANISM FOR STRAIGHT KNITTING MACHINES

Filed July 28, 1945 12 Sheets-Sheet 6

FIG. 7.

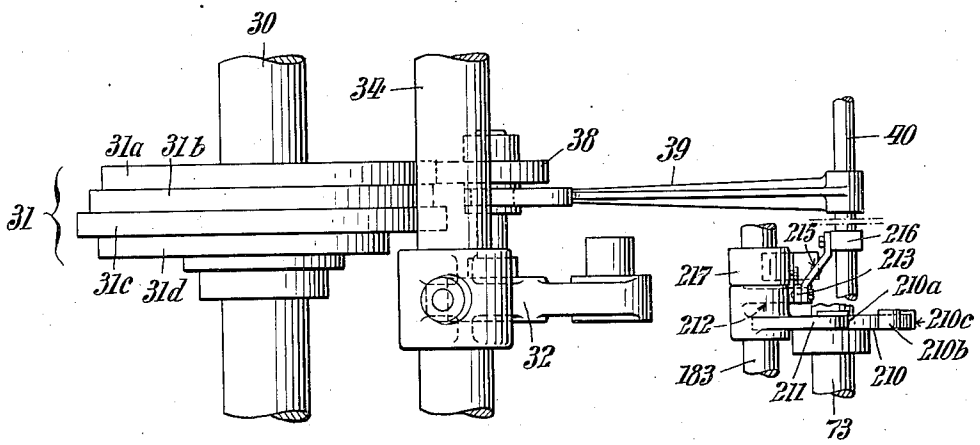
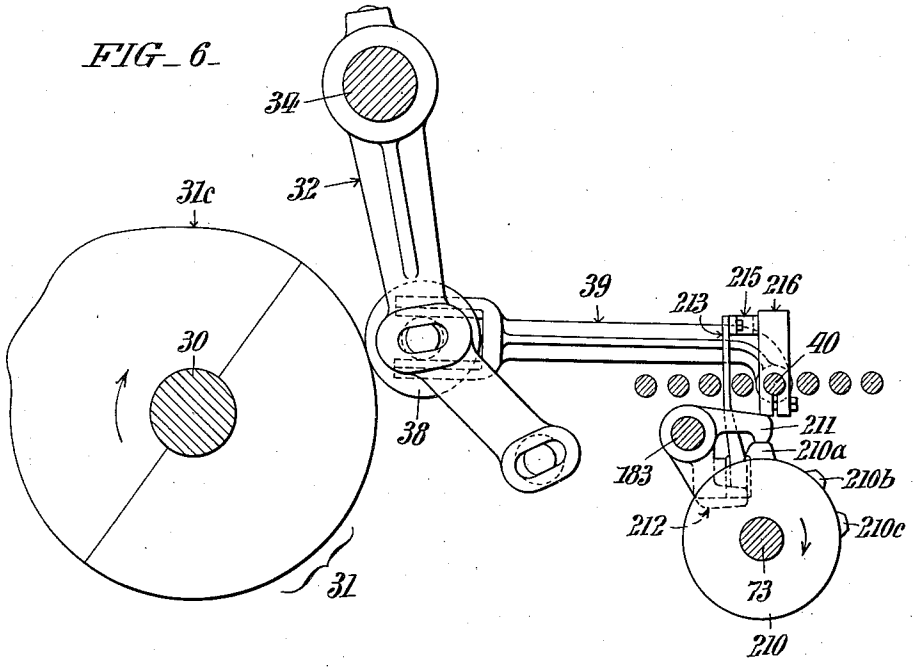


FIG. 6.



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HEEL FASHIONING MECHANISM FOR STRAIGHT KNITTING MACHINES

Filed July 28, 1945 12 Sheets-Sheet 7

FIG. 13.

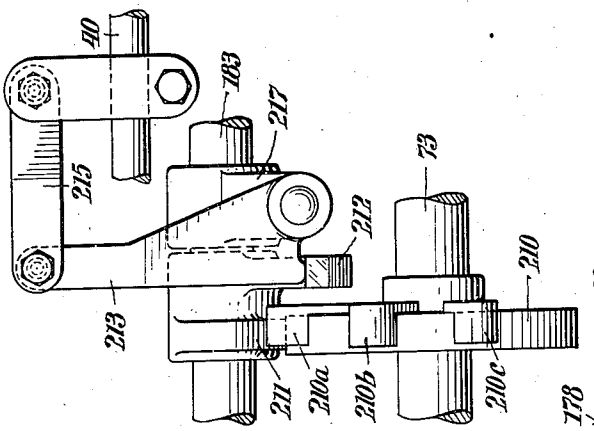
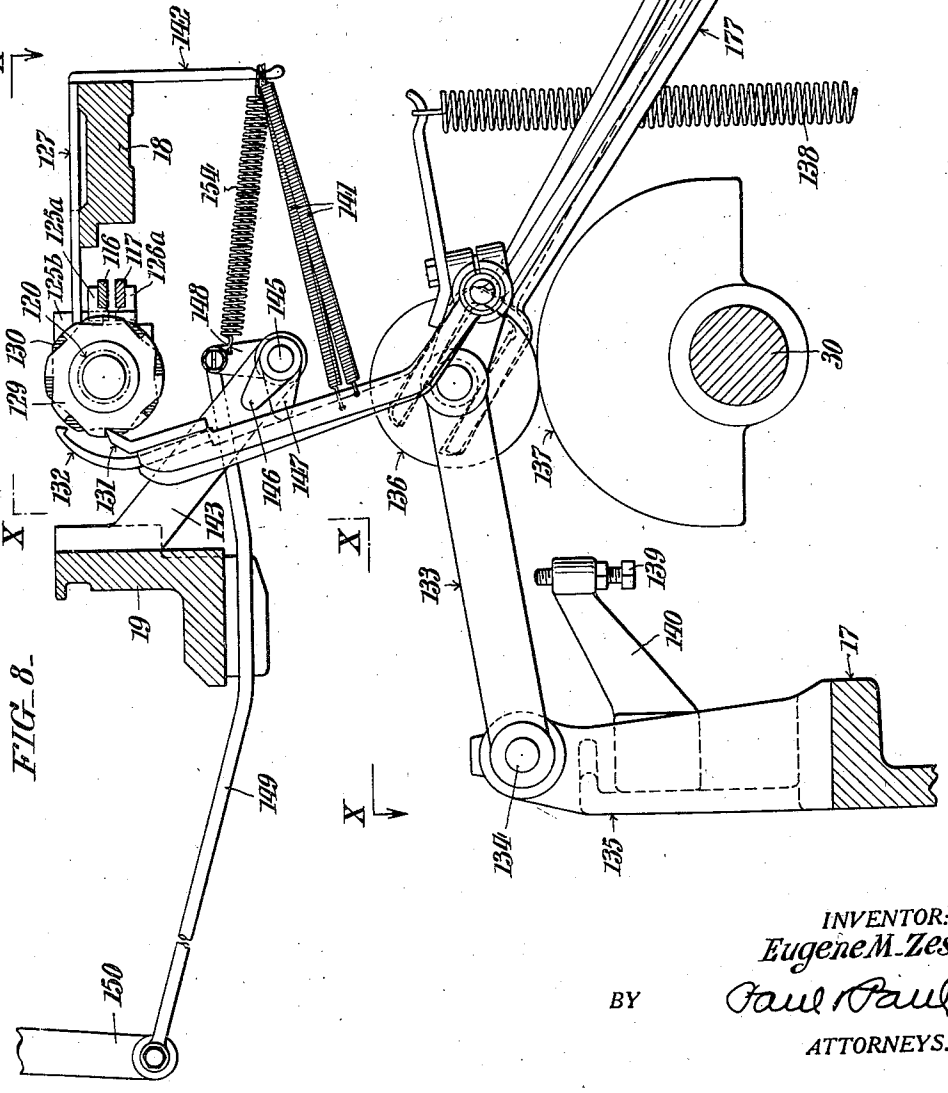


FIG. 8.



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HEEL FASHIONING MECHANISM FOR STRAIGHT KNITTING MACHINES

Filed July 28, 1945 12 Sheets-Sheet 8

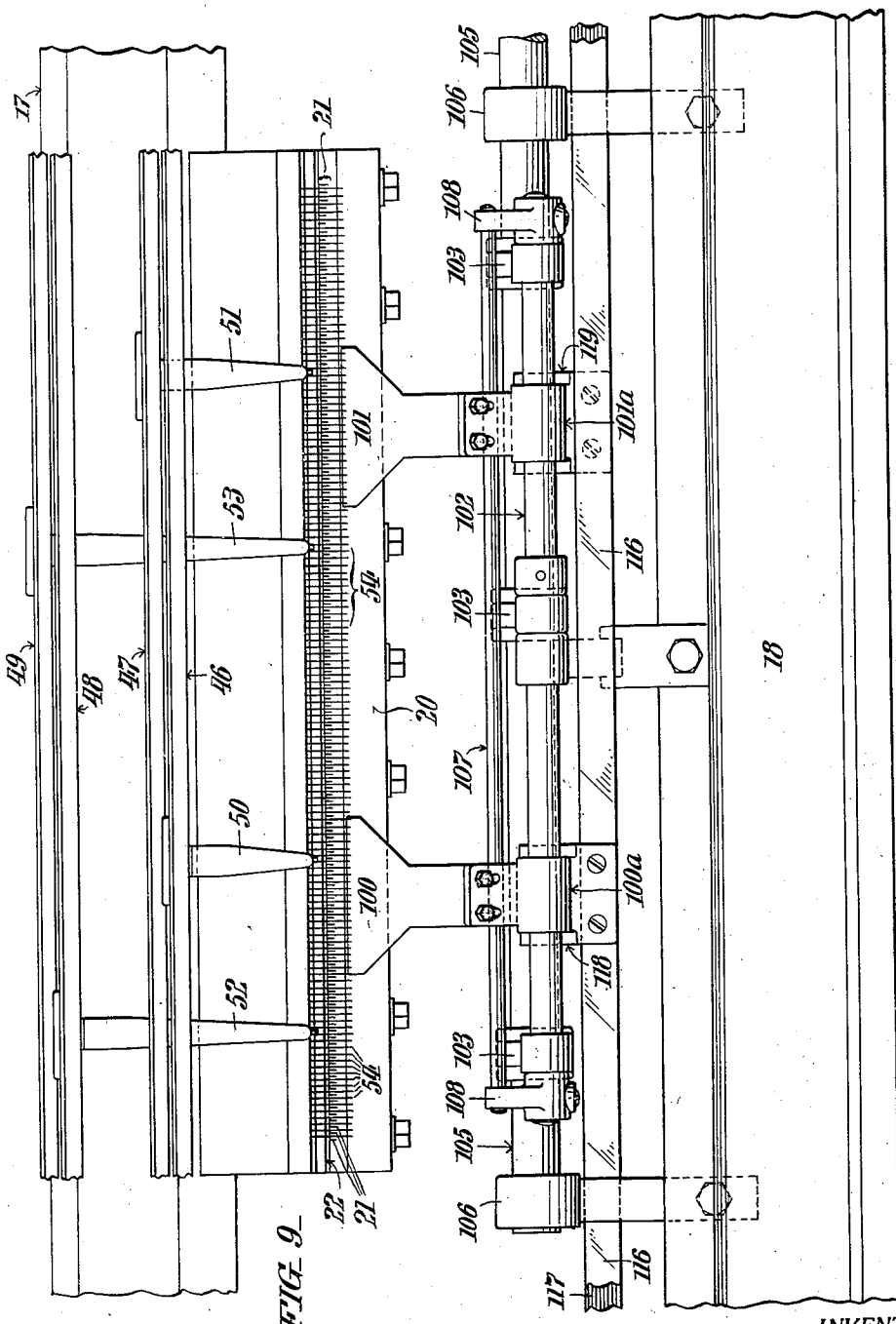


FIG. 9

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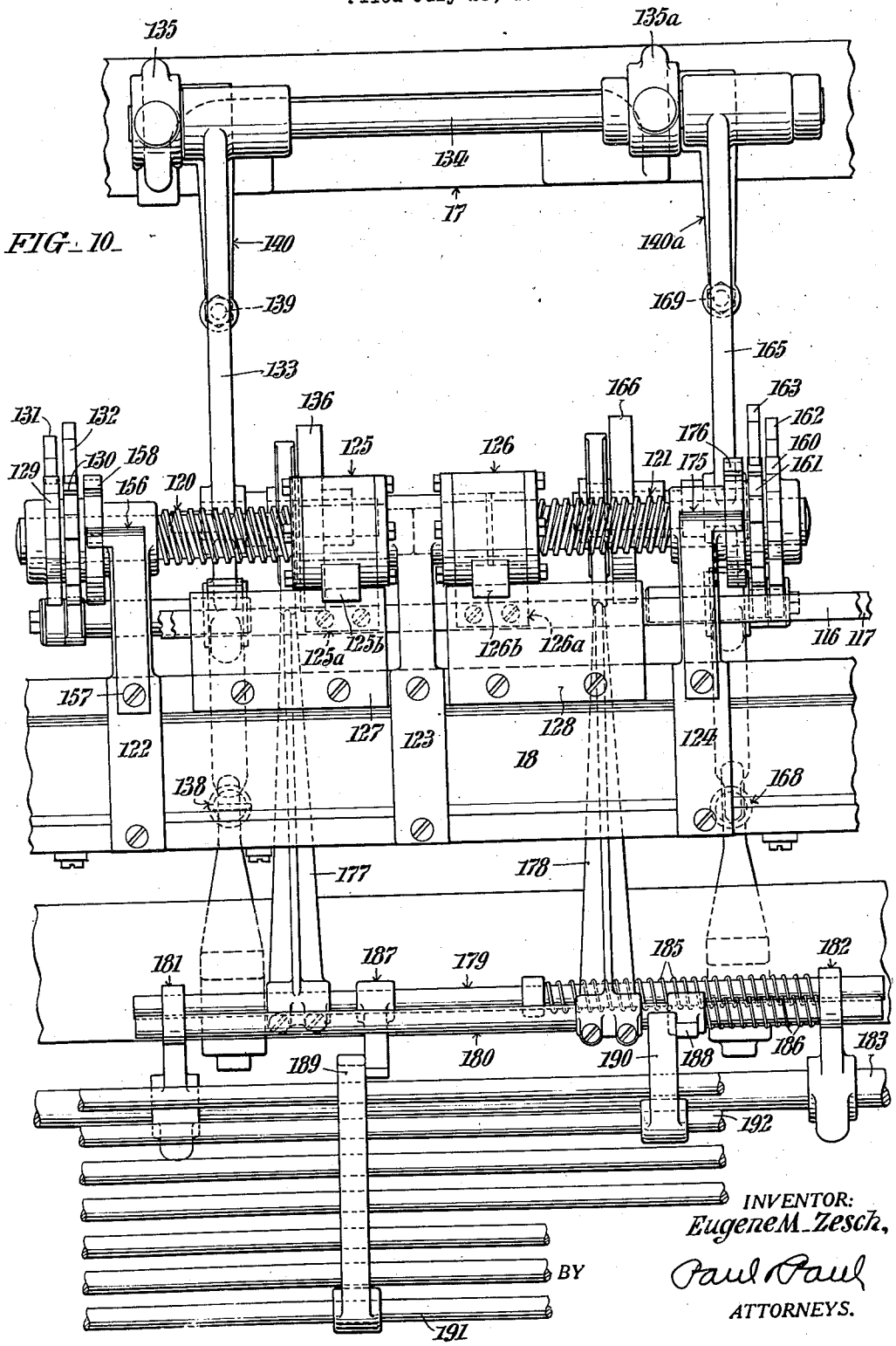
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HEEL FASHIONING MECHANISM FOR STRAIGHT KNITTING MACHINES

Filed July 28, 1945 12 Sheets-Sheet 9

FIG. 10.



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Dec. 9, 1947. E. M. ZESCH 2,432,108

HEEL FASHIONING MECHANISM FOR STRAIGHT KNITTING MACHINES

Filed July 28, 1945 12 Sheets-Sheet 10

FIG. 12.

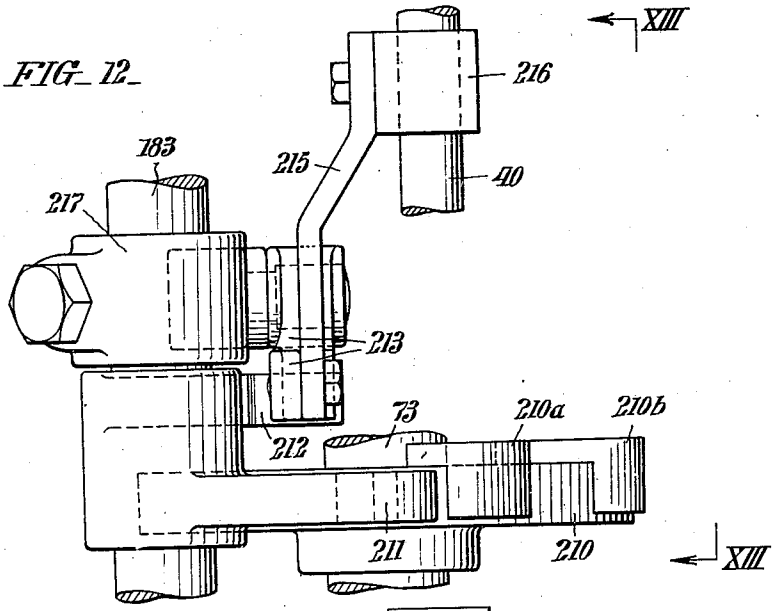
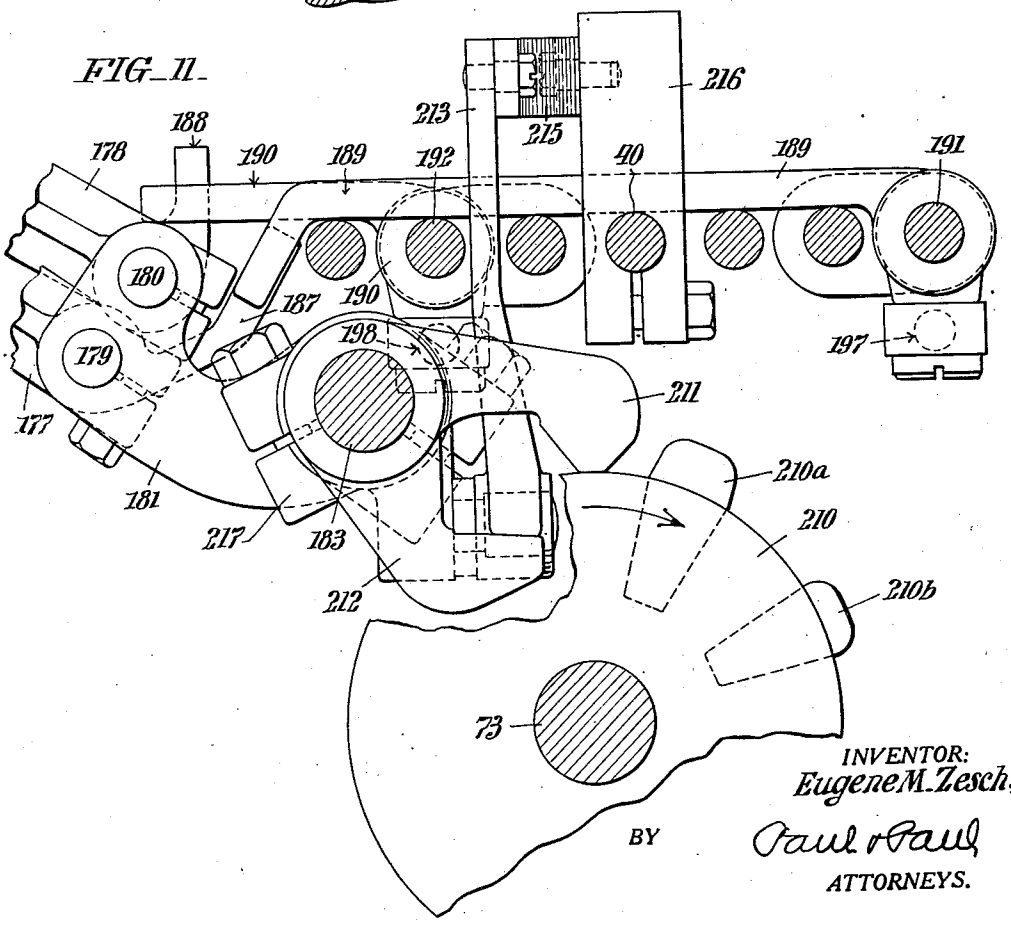


FIG. 11.



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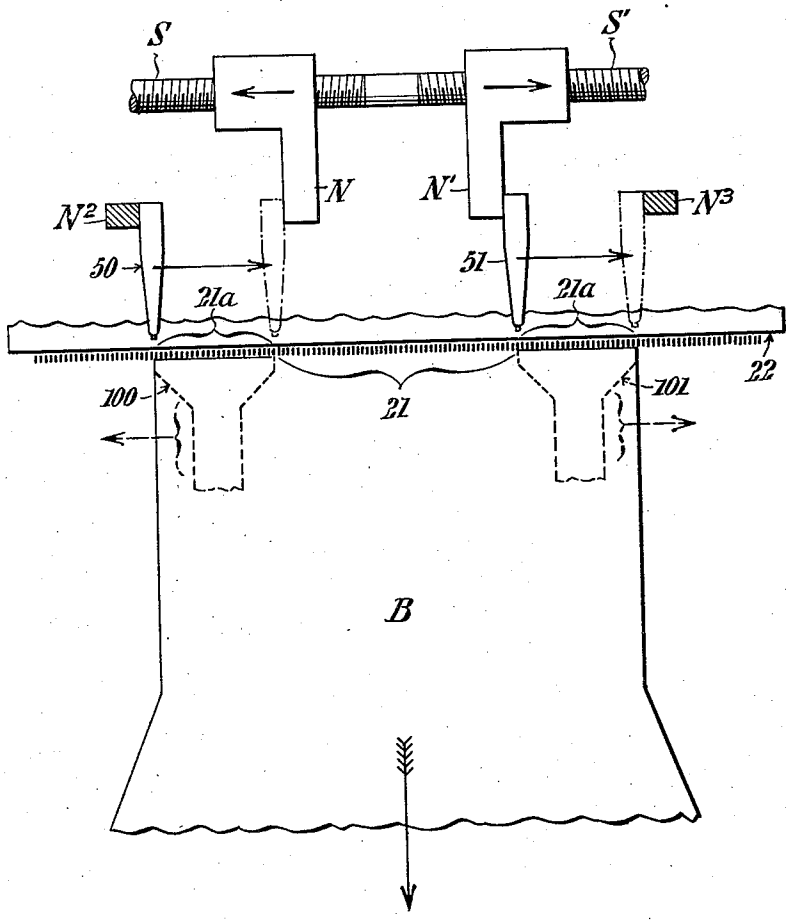
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Filed July 28, 1945 12 Sheets-Sheet 11

FIG. 15.



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Dec. 9, 1947. E. M. ZESCH 2,432,108

HEEL FASHIONING MECHANISM FOR STRAIGHT KNITTING MACHINES

Filed July 28, 1945 12 Sheets-Sheet 12

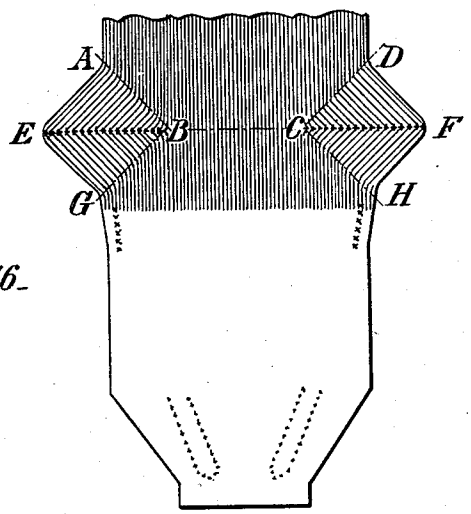


FIG. 16.

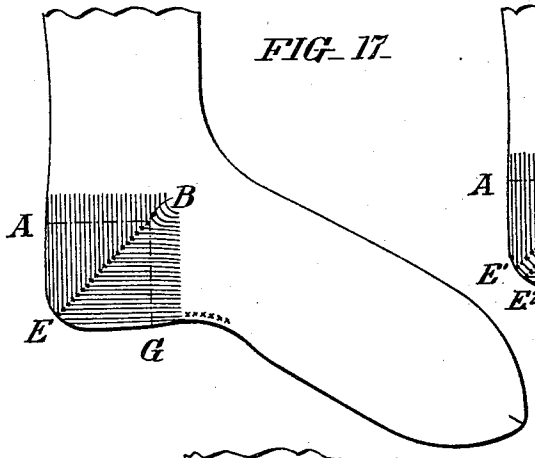


FIG. 17.

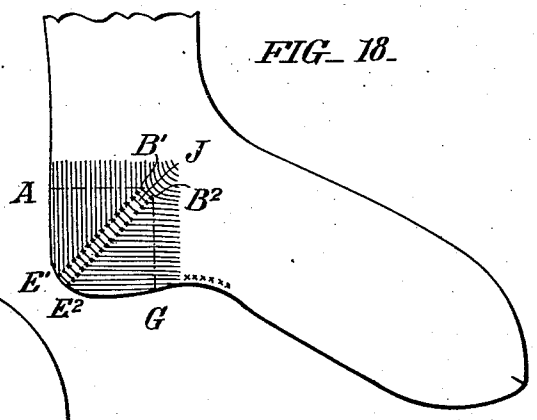


FIG. 18.

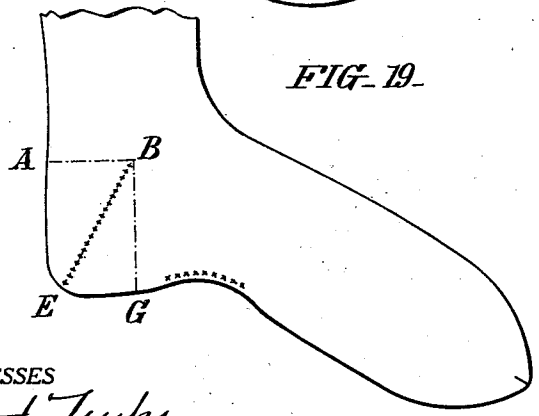


FIG. 19.

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Patented Dec. 9, 1947

2,432,108

UNITED STATES PATENT OFFICE

2,432,108

HEEL FASHIONING MECHANISM FOR STRAIGHT KNITTING MACHINES

Eugene M. Zesch, Shillington, Pa., assignor to Rosedale Knitting Company, Laureldale, Pa., a corporation of Pennsylvania, and Karl Lieberknecht, Inc., Reading, Pa., a corporation of Pennsylvania

Application July 28, 1945, Serial No. 607,556

15 Claims. (Cl. 66—89)

1

This invention relates to straight knitting machines, and has reference more particularly to straight multi-section knitting machines of the "Cotton" type such as are ordinarily employed in the commercial production of fashioned hosiery.

In connection with machines of the kind referred to, I aim to provide simple and reliable mechanism by aid of which it is possible to continuously and expeditiously knit complete flat stocking blanks having either square or oblong inset or gore heel cheeks.

Another object of my invention is to provide mechanism having the foregoing attributes which can be readily incorporated in existent flat hosiery machines without necessitating any structural changes in them or interfering with their normal mode of operation insofar as the formation of the leg and foot portions of the stocking blanks is concerned.

As hereinafter more fully disclosed, my improved heel fashioning mechanism has a pair of blade-like auxiliary presser elements in association with each needle bar of the machine, these blades being rendered active after the completion of the leg and ankle portions of a stocking blank (at which time the press movement of the corresponding needle bar is modified to prevent a midgroup of instep needles from contacting the presser ledge) to cause end groups of the needles only to engage the presser bar in stitch formation; means for laterally shifting the presser elements relatively at definite intervals away from each other for a time, and thereafter shifting them laterally toward each other likewise at definite intervals for a time, or vice versa, to form the heel cheeks at opposite edges of the stocking blank. The mechanism is moreover so constructed and organized as to make possible the shifting of the presser elements at different intervals as between the two phases of the heel knitting.

Other objects and attendant advantages will appear from the more detailed description which follows of the attached drawings, wherein

Figs. 1 and 2, considered together, show a broken-out fragmentary view of a typical straight hosiery knitting machine, partly in top plan and partly in horizontal section, conveniently embodying my invention.

Fig. 3 shows the front elevation of the portion of the machine pictured in plan in Fig. 1.

Fig. 4 is a staggered transverse sectional view of the machine drawn to a larger scale and taken as approximately indicated by the angled arrows IV—IV in Fig. 2.

Fig. 5 is a transverse sectional view taken as indicated by the angled arrows V—V in Figs. 1 and 3.

2

Fig. 6 is a fragmentary view corresponding to Fig. 4 showing certain elements of the machine in greater detail.

Fig. 7 shows the top plan of the parts illustrated in Fig. 6.

Fig. 8 is a detail cross sectional view taken as indicated by the arrows VIII—VIII in Fig. 2.

Fig. 9 is a fragmentary view in top plan looking as indicated by the angled arrows IX—IX in Fig. 4.

Fig. 10 is a fragmentary view in top plan looking as indicated by the angled arrows X—X in Fig. 8.

Fig. 11 is a fragmentary detail cross sectional view taken as indicated by the angled arrows XI—XI in Fig. 2.

Fig. 12 is a fragmentary view in top plan of certain of the parts illustrated in Fig. 11.

Fig. 13 is a view in front elevation of the parts shown in Fig. 12, looking as indicated by the angled arrows XIII—XIII in the latter illustration, and also in Fig. 2.

Fig. 14 is a fragmentary detail view corresponding to Fig. 4 showing how the needles are flexed by the auxiliary presser elements to bring their beards into contact with the presser ledge of the machine during stitch formation in the fashioning of the heel cheeks of stocking blanks.

Fig. 15 is a diagrammatic view showing the knitting elements of the machine and the auxiliary presser elements and other parts positioned in readiness to begin the knitting of the heel cheeks of a stocking blank.

Fig. 16 is a fragmentary view showing a portion of a stocking blank as it comes from the machine.

Fig. 17 is a view in side elevation showing the foot portion of a finished stocking.

Fig. 18 is a view similar to Fig. 17 showing a modification of the stocking foot illustrated in the latter view; and

Fig. 19 is likewise a view similar to Fig. 17 showing another modification.

The knitting machine herein chosen for convenience of exemplifying my invention is generally of well known construction in that it has transverse frames of which one is indicated at 15 in Fig. 4 which are connected by front and back beams 16 and 17, a front bed 18 and a center bed 19. Disposed after common practice in the intervals between the transverse frames 15 are one or more knitting units each comprising at least one needle bar 20 with a series of spring needles

21 the beards of all of which are closed, except during heel tab knitting as will be later explained, by contact with a presser ledge 22 on the usual sinker head 23 mounted on the center bed 19. The usual knockovers which also cooperate in the knitting are indicated at 24. Each needle bar 20 is pivotally connected to horizontal arms 25 which project inwardly from a rock shaft 26 extending longitudinally of the machine and supported in suitable bearings afforded by said cross frames. Secured to the shaft 26 is a pendent spring-biased arm 27 with a roller 28 arranged to engage a rotary cam 29 on the main cam shaft 30 of the machine. By the action of the parts just described, the necessary up and down movements are imparted to the needle bar 20 in a well known way incident to stitch formation. In and out or press movements are concurrently imparted to the needle bar 20 as required in ordinary knitting from another cam 31 on the cam shaft 30 through a roller arm 32 mounted on another rock shaft 34 with a second arm 35, which, through a link 36 is detachably connected to a pendent arm 37 connected to said needle bar.

As usual, and as best shown in Figs. 6 and 7, the press cam 31 comprises several sections 31*a*, 31*b*, 31*c* and 31*d*, the first of which is used for "idle" courses, and the others respectively during welt formation, during ordinary knitting and during narrowing. The roller 38 on the press arm 32 is mounted so as to be axially shiftable from one section of the cam 31 to another by means of a fork 39 affixed to a slide rod 40 which extends longitudinally of the front of the machine with others later on referred to, all being confined to endwise movement in suitably-spaced fixed brackets (not shown) on the machine framing. Also as usual, the machine is equipped with a plurality of longitudinally reciprocating carrier bars (Figs. 2, 4 and 9) which are supported by standards 45 at a level above the sinker head 23, four of such bars being shown at 46, 47, 48 and 49 as having connected to them carriers 50, 51, 52 and 53 for laying the knitting yarns into the notches of the sinkers 54 which are supported for horizontal sliding movement in said sinker head in a well known way.

The machine is also provided with a main timing chain 55 (Figs. 1, 3 and 5) which controls the various phases of a knitting cycle during which the stocking blanks are produced. This timing chain 55 is trained about end driving and idler sprocket drums 56, 57 which are mounted to rotate about studs 58 and 59 projecting laterally outward from brackets 60, 61 on the front beam 16 of the machine framing. The drum 56 is intermittently rotated through picking of a ratchet wheel 62 thereon by a pawl 63 carried by an arm 65 which is free on the stud 58 and which is oscillated from another rotary cam 67 on the main cam shaft 30, the intermediate connections including a spring-biased bell crank lever 68 with a roller 69 on its upright extremity 68*a* to bear against said cam, and with its horizontal extremity 68*b* in engagement with the pawl arm 65 from above. As shown in Figs. 1 and 3, a spring 70 serves to yieldingly maintain the latter engagement, while another spring 71 yieldingly holds the pawl 63 to the ratchet wheel 62. The machine is further provided with what are generally referred to as the upper and lower "automatic" shafts which are intermittently rotated, and which are shown at 72 and 73 in Figs. 1, 2, 3 and 5 as extending longitudinally of the top and bottom of the machine at the back and

front. The upper automatic shaft 72 is supported in bearing standards, whereof one is indicated at 75 in Fig. 4, rising from the transverse frames 15, and is intermittently rotated from another rotary cam 76 on the main cam shaft 30 through a spring biased arm 77 with a roller 77*a* (Fig. 5). As shown the arm 77 is secured to a rock shaft 78 mounted in a bearing bracket 79 on the back beam 17 of the machine framing, together with a second arm 80 having an upright link connection 81 with an arm 82 which is free on the shaft 72 and carries a pawl 83 to cooperate with a ratchet wheel 85 on the latter shaft. The means for intermittently rotating the lower automatic shaft 73 include a ratchet wheel 86 (Figs. 3 and 5) thereon arranged to be picked by a pawl 87 which is pivotally connected to a pendent roller arm 88 free between collars 89 on the press shaft 34, said arm being subject to a spring whereby its roller 90 is yieldingly maintained in peripheral contact with another rotary cam 91 on the main cam shaft 30. The lower automatic shaft 73 is turned through one complete rotation for each knitting cycle of the machine through shifting of the cam roller 90 by means under control of the timing chain 55. Accordingly the chain 55 is provided with suitably-arranged buttons such as the one shown at 55*a* in Fig. 3 adapted to act upon the finger extremity of a bell crank lever 92, which, through a link 93 is coupled to a slide rod 94 having a shifting fork 90*a* thereon for the roller 90 on arm 88. Thus, each time a button 55*a* on the chain 55 underpasses the bell crank lever 92, the roller is displaced into the plane of the cam 91 on the main cam shaft 30 with resultant impartation of a rotative shift to the ratchet wheel by the pawl 87. Means (not shown) similar to the above is in practice provided for controlling the roller 77*a* of the arm 77 through which the upper automatic shaft 72 is intermittently rotated.

The machine also has an auxiliary timing chain 95 (Fig. 2) which controls the operation of stop mechanism for variantly limiting the throw of the splicing yarn carriers used in producing shaped high heel and cradle foot reinforcements in the stocking blanks, said mechanism being diagrammatically shown in Fig. 15 as including stop nuts N and N′ and intermittently rotated screws S and S′ for variantly limiting the inward movement of the carriers. The auxiliary timing chain 95 is trained about sprocket drums whereof one is indicated at 96 in Fig. 2 as mounted on the lateral stud projection 97 of a fixed bracket 98 on the front beam 16 of the machine framing. A ratchet wheel 99 associated with the sprocket drum 96 is adapted to be picked by pawling mechanism (not shown) in a manner similar to that above described in connection with the main timing chain. It is to be understood that the operative phases of the auxiliary chain 95 are controlled as usual from the main timing chain 55 by suitable mechanism (not shown) with which the present invention is not directly concerned.

In adapting my invention to a flat knitting machine such as briefly described above, I provide, in connection with each bank of needles, an auxiliary presser mechanism including two presser blades 100 and 101 which are of a width to comprehend corresponding groups of end needles, and which are pivotally and slidably supported on a longitudinally-arranged rod 102 extending between a pair of spaced upright arms 103 on a rock shaft 105. This rock shaft 105 is supported by inwardly-projecting brackets 106 on the front bed

18 of the machine. As shown in Fig. 4 the free ends of the presser blades 100 and 101 normally rest on the top of the needle bar 20 so as to be capable of following the latter in its up and down movements. A stop rod 107 extending between fixed lug collar arms 108 on the bar 102 however serves to limit the downward movement of the blades 100 and 101, said collars being rotatively adjustable on said bar. The means relied upon to rock the shaft 105 includes a pendent arm 109 (Fig. 4) with an axially shiftable roller 110 at its lower end, which is adapted to be engaged by a cam 111 on the main cam shaft 30. The movement of the shaft 105 is restricted in one direction as the consequence of the engagement of a finger 112 thereon with a fixed stop rod 113, said finger being yieldingly urged toward said rod by a pull spring 115. During the formation of the heel tabs of the stockings, the presser blades 100 and 101 are shifted toward and away from each other for capacity to select between and act upon different groups of end needles. This selective action is effected through means comprising a pair of longitudinal slide bars 116 and 117 disposed in superposed relation immediately inward of the center bed 18 of the machine and confined to guide notches in the bearing brackets 106 for the rock shaft 105. The bars 116 and 117 extend the full length of the machine so as to serve for the presser blades associated with all of the other needle bars. From Figs. 2 and 9 it will be noted that to the slide bars 16 and 117 are respectively affixed inwardly reaching projections 118 and 119 with spaced lugs between which latter the fulcrumed bosses 100a and 101a of the presser blades 100 and 101 are engaged. The bars 116 and 117 are intermittently shiftable by means shown in Figs. 2, 8 and 10 as including a pair of axially-aligned oppositely-threaded screw spindles 120 and 121 which have their ends journaled in inwardly-reaching bearing brackets 122, 123 and 124 on the front bed 18 of the machine and which are engaged by nuts 125, 126 respectively having lateral flanges 125a and 126a secured by screws to said bars. The nuts 125, 126 are restrained against turning as a consequence of the engagement of slotted lateral lugs 125b and 126b thereon with guide plates 127, 128 affixed to the front bed 18. Pinned or otherwise secured to the outer end of the spindle 120 are reversely pitched ratchet wheels 129 and 130 adapted to be picked by pawls 131 and 132 pivotally connected to the swinging end of a horizontal arm 133 (Figs. 2 and 8) which is free on a shaft 134 rotative in bearing brackets 135, 135a upstanding from the back beam 17 on the machine. The arm 133 carries an axially-shiftable roller 136 arranged to cooperate with a semi-annular cam 137 on the main cam shaft 30 of the machine, said arm being yieldingly urged toward said cam by a spring 138 and its downward movement being limited by a stop screw 139 adjustable in a projection 140 of the bracket. The pawls 131 and 132 are biased toward the ratchets 129, 130 by springs 141 in tension between them and an anchorage 142 attached to the front bed 18 of the machine. Oscillatably supported in bearing brackets 143 extending forwardly and downwardly from the center bed 19 is a shaft 145 with angularly-spaced fingers 146, 147 thereon which respectively react upon the pawls 131 and 132 to render the use of the latter selective in a manner also later explained. The shaft 145 is actuated through an arm 148 thereon connected by a rearwardly extending horizontal link rod 149 to a pendent arm 150 secured to a rock shaft 151

(Figs. 2 and 4) with a finger 152 which bears on the periphery of a cam disk 153 affixed to the upper automatic shaft 72 said disk having a single cam rise 153a. The finger 152 is yieldingly maintained in contact with the cam disk by the action of a spring 154 (Fig. 8) in tension between the arm 148 and another fixed anchorage 155 on the center bed 18 (Fig. 2). A spring detent 156 secured by a screw 157 to the bearing bracket 122 cooperates with a notched disk 158 on the screw spindle 120 alongside the ratchet wheel 130 to prevent accidental rotative displacement of said shaft in shifted positions. The spindle 121 is similarly provided at its outer end with a pair of reversely pitched ratchet wheels 160, 161 arranged to be picked respectively by pawls 162, 163 at the swinging end of another horizontal arm 165 which is free on the shaft 134 and carries an axially shiftable roller 166 to cooperate with another semi-annular cam 167 on the main cam shaft 30. The roller arm 165 is subject to the downward pull of a spring 168 and its movement in that direction is limited by an adjustable stop screw 169 in a projection 169a of the bearing bracket 135a. Here also the pawls 162, 163 are urged toward the ratchet wheels 160, 161 by springs 170 (Fig. 2) in tension between them and a fixed anchorage 171, and selection is had in the use of said pawls through stop fingers 172, 173 angularly spaced on the oscillatable shaft 145, overthrow of the spindle 121 being prevented through cooperation of a spring detent 175 with a notchet disk 176 thereon. The rollers 136 and 166 on the arms 133 and 165 are shiftable respectively by forks 177 and 178 secured to separate short parallel rods 179 and 180 at the front of the machine. As shown, the rods 179 and 180 are slidable in bearing brackets 181 and 182 in turn secured to the loop regulating shaft 183 which also extends longitudinally of the front of the machine. The springs indicated at 185 and 186 in Fig. 10 yieldingly urge the rods 179 and 180 leftward to keep lug collars 187 and 188 respectively on them in engagement with stops 189 and 190 on parallel control rods 191 and 192 also disposed longitudinally of the machine at the front, and guided in stationary bearing projections on the machine framing, two of such projections being shown at 193 and 194 in Fig. 2. Affixed to the rods 191 and 192 are collars 195 and 196 which through link rods 197 and 198 are connected to pivoted fingers 199, 200 arranged to be actuated by special cam buttons (not shown) on the auxiliary timing chain 95. Helical springs 203, 204 surrounding the rods 191, 192 and in compression between the bearing projections 193, 194 and other collars 205, 206 on said rods tend to maintain the fingers 199, 200 yieldingly in operative contact with the auxiliary chain 95.

The slide rod 40 previously referred to for the fork 39 by which the roller 38 (Figs. 2, 6 and 7) is shifted on the press cam 31, is in accordance with my invention actuated from a cam 210 on the lower automatic shaft 73, said cam having rises 210a, 210b and 210c of various heights which act upon a finger 211 fulcrumed on the loop regulating shaft 183 with a lift finger 212 which overreaches a bell cam lever 213 connected by a link 215 with a fixed projection 216 on said rod, said bell cam lever being pivoted to a fixed collar 217 on said loop regulating shaft.

The means relied upon for shifting the roller 110 to and from the cam 111 includes a fork 218 which is secured to a short slide rod 219 (Figs. 2 and 4) guided in the bearing projections 193 and 194 through a link 220; the rod 219 is

connected to bell cam lever 221 (like the lever 213) arranged to be actuated by a finger 222 which lies in the path of cam projections 223a of another disk 223 fixed to the lower automatic shaft 73.

The operation of the machine is as follows:

Let it be assumed that the leg and ankle portion of the stocking blank in Fig. 16 has been produced down to the line A—B—C—D in the usual well known way. When this line is reached, the roller 38 is automatically moved to the idle course section 31a of the press cam section 31 as in Fig. 7 as the rise 210a of cam disk 210 on the lower automatic shaft 73 underpasses the finger 211 in Fig. 6, to prevent the mid group of the needles 21a (Fig. 15) corresponding to the instep portion of the stocking from B to C from being pressed by contact with the presser ledge during heel knitting and thus hold their loops while the heel cheeks are being formed as presently explained. Also let it be assumed that the presser blades 100, 101 were left in the position in which they are shown in Fig. 15 at the completion of the heel knitting of a previous stocking blank; that the rollers 136, 166 (Fig. 2) have been moved onto the cams 137, 167 by shifting of the arms 177, 178 under control of the auxiliary chain 95 through the links 197, 198 and rods 191, 192 and 179, 180 to cause actuation of the pawls 131, 162 and picking of the ratchet wheels 129, 160 to intermittently rotate the screw spindles 120, 121; and that the roller 110 has been displaced into the path of cam 111 as in Fig. 2 by the arm 218 through shifting of the rod 219 as the rise 223a of the disk 223 underpassed the finger 222. During the heel knitting all four of the yarn carriers 51, 52, 53 and 54 are operated in actual practice; but since the carriers 53, 54 are used to feed splicing yarns for reinforcing purposes, they need not be further considered herein. However, let it be understood that, during the heel knitting, the traverse of the carriers 53, 54 is controlled in the same way as presently described in connection with the carriers 51 and 52 by which the main or foundation yarns of the heel cheeks are fed. With the foregoing conditions established, the heel knitting ensues.

Incident to the formation of the upper sections H of the heel cheeks, the presser blades 100 and 101 are intermittently shifted outward relatively to each other in Fig. 15, the timing in the present instance being so ordered that such shifting is effected through a distance of two needles in every other course of the knitting. At the same time, the screws S and S' (Fig. 15) are intermittently rotated by the usual means (not shown) provided for that purpose to variantly limit the traverse of the carriers 51, 52 as required to feed their yarns to the changing numbers of the end needles operated by the presser blades 100 and 101. This action is allowed to continue for a suitable period and results in the formation of the triangular upper heel tab sections A—B—E and C—D—F as shown. As this initial stage of the heel knitting is completed, the rise 153a of cam disk 153 (Fig. 4) on the upper automatic shaft 72 engages the finger 152 and through the arm 150, the link 149 and the arm 148 (Figs. 2 and 8) causes a partial clockwise rotation of shaft 145, with the result that the fingers 146, 147 and 172, 173 are moved to a position by which the pawls 131, 162 are displaced from the ratchet wheels 129, 160, and the pawls 132, 163 permitted to engage the ratchets 130, 161, whereafter the screw spindles 120 and 121 are intermittently rotated, as before, but now in the opposite direction. As a consequence, the presser blades 100, 101 are intermittently shifted inwards or toward each other each time by the distance of two needles for every other course of the knitting. In this connection it is to be understood that the intermittent rotation of the screws S, S' is also reversed for variation of the traverse of the yarn carriers 53, 54, so that the yarns of the latter are properly fed to the changing numbers of end needles 21a operated by the presser blades 100, 101. This reverse procedure is continued until the presser blades 100 and 101 again reach the positions which they originally occupied in Fig. 15 and results in the production of the lower sections E—B—G and C—F—H of the heel cheeks, with incidental formation of diagonal sutures E—B and C—F. At the completion of the heel knitting, the upper and lower automatic shafts 72 and 73 are given rotative shifts whereby the heel fashioning mechanism is rendered idle, and the machine automatically restored to normal condition for completion of the stocking foot which may be effected in any of the well known ways. The use in the machine, as illustrated in Fig. 14, of hooked knock-overs is not necessarily essential to the successful operation of my invention, since, in actual practice, plain notched knock-overs of the older and more common type serve equally as well.

As an alternative I may, between the two stages of the heel knitting run in a few courses (by use for example of one of the carriers 50, 51) all the way across the stocking blank with resultant production of a stocking such as shown in Fig. 18 in which the heel cheeks are characterized by having two spaced diagonal sutures E'—B' and E^2—B^2 with the full width courses run in as aforesaid indicated at J intervening.

The stocking of Fig. 19 is produced in the same way as the stocking of Fig. 17, except that during the second stage of the heel knitting, the presser blades 100, 101 are shifted once for every third course of the knitting. This change in the procedure results in the formation of vertically oblong heel cheeks as shown, likewise however with diagonal sutures, and may be accomplished for example, by changing the buttons on the auxiliary timing chain 95.

Having thus described my invention, I claim:

1. In a straight knitting machine, a bar with a series of spring beard needles; means for imparting up and down movements to the needle bar in stitch formation; a presser ledge; an element independently supported for capacity to rise and fall with the needle bar and adapted to engage the needles from behind to urge them into contact with the presser ledge in stitch formation; and means for actuating said element in timed relation with the movements of the needle bar.

2. In a straight knitting machine, a bar with a series of spring beard needles; a presser ledge; a rotary shaft operative through interposed instrumentalities to impart up and down movements to the needle bar in stitch formation; presser mechanism including an element independently supported for capacity to rise and fall with the needle bar, and adapted to engage the needles from behind to urge them into contact with the presser ledge in stitch formation; and means motivated from the shaft aforesaid for actuating said element in timed relation with the movements of the needle bar.

3. In a straight knitting machine, a bar with a series of spring beard needles; means for im-

parting up and down movements to the needle bar in stitch formation; a presser ledge; an element independently supported for capacity to rise and fall with the needle bar and adapted to engage a group of the needles from behind to urge them into contact with the presser ledge in stitch formation; means for actuating said member in timed relation with the movements of the needle bar; and means for intermittently shifting said element laterally for operation upon different groups of the needles.

4. In a straight knitting machine, a bar with a series of spring beard needles; means for imparting up and down movements to the needle bar in stitch formation; a presser ledge; a press element pivotally supported independently of said needle bar for capacity to rise and fall with the needle bar, and adapted to engage the needles from behind in urging them into contact with the presser ledge; and means for actuating said element in timed relation to the movements of the needle bar.

5. In a straight knitting machine, a bar with a series of spring beard needles; means for imparting up and down movements to the needle bar in stitch formation; a presser ledge; a press element in the form of a horizontal plate with its front edge resting upon the needle bar, and adapted to engage the needles from behind in urging them into contact with the presser ledge; a support to which the press element is pivotally connected at the rear for capacity to rise and fall with the needle bar, and means arranged to move the support back and forth laterally for actuation of the element in timed relation with the needles.

6. In a straight knitting machine, a bar with a series of spring beard needles; means for imparting up and down movements to the needle bar in stitch formation; a presser ledge; a press element in the form of a horizontal plate with its front edge resting upon the needle bar and adapted to engage the needles from behind in urging them into contact with the presser ledge; a rocker arm to which the press element is pivotally connected at the rear for capacity to rise and fall with the needle bar; and means arranged to oscillate the rocker arm for actuation of the press element in timed relation with the needles.

7. In a straight stocking knitting machine, a needle bar with a series of spring beard needles; a presser ledge; means for imparting up and down movements to the needle bar; means for concurrently imparting in and out or press movements to cause the needle beards to engage the presser ledge in the knitting of the leg and foot portions of the stocking blanks; a normally inactive supplemental presser mechanism including a pair of blade elements for engaging end groups of needles from behind during heel knitting; normally quiescent means for actuating said elements; means for modifying the press movement of the needle bar at the commencement of the heel knitting to prevent pressing of the instep needles, and for initiating an operative phase of the blade element actuating means; and means for progressively and concurrently shifting the blade elements laterally relative to each other in one direction at definite intervals for a time, and thereafter reversing the procedure to determine the formation of fashioned heel tabs.

8. In a straight stocking knitting machine, a needle bar with a series of spring beard needles; a presser ledge; means for imparting up and down movements to the needle bar; means for concurrently imparting in and out or press movements to cause the needle beards to engage the presser ledge in the knitting of the leg and foot portions of stocking blanks; a normally inactive supplemental presser mechanism including a pair of blade elements for engaging end groups of needles from behind in heel tab knitting, and normally quiescent means for actuating said elements; means for modifying the press movement of the needle bar at the commencement of the heel knitting to prevent pressing of the instep needles, and for initiating an operative phase of the blade element actuating means; and means for progressively and concurrently shifting the blade elements laterally relative to each other at definite intervals in one direction for a time, and thereafter reversing the procedure with lateral shifting of said blade elements at different intervals to determine the formation of fashioned heel tabs.

9. In a straight stocking knitting machine, a needle bar with a series of spring beard needles; a presser ledge; means for imparting up and down movements to the needle bar; means for concurrently imparting in and out or press movements to cause the needle beards to engage the presser ledge in the knitting of the leg and foot portions of the stocking blanks; a normally inactive supplemental presser mechanism including a pair of blade elements for engaging and groups of needles from behind in heel knitting, and normally quiescent means for actuating said elements; means for modifying the press movement of the needle bar at the commencement of the heel knitting to prevent pressing of the instep needles, and for initiating an operative phase of the blade element actuating means; and means for progressively and concurrently shifting the blade elements laterally relative to each other at definite intervals by the distance of two needles for a time, and thereafter reversing the procedure to determine the formation of fashioned heel tabs.

10. In a straight stocking knitting machine, a needle bar with a series of spring beard needles; a presser ledge; means for imparting up and down movements to the needle bar; means for concurrently imparting in and out or press movements to cause the needle beards to engage the presser ledge in the knitting of the leg and foot portions of the stocking blanks; a normally inactive supplemental presser mechanism including a pair of blade elements for engaging end groups of needles from behind in heel knitting, and normally quiescent means for actuating said elements; means for modifying the press movement of the needle bar at the commencement of the heel knitting to prevent pressing of the instep needles, and for initiating an operative phase of the blade element actuating means; and means for progressively and concurrently shifting the blade elements laterally relative to each other in one direction at each actuation and at definite intervals by the distance of two needles for a time, and thereafter reversing the procedure with lateral shifting of said blade elements at different intervals to determine the formation of fashioned heel tabs.

11. In a straight stocking knitting machine, a needle bar with a series of spring beard needles; a presser ledge; means for imparting up and down movements to the needle bar; means for concurrently imparting in and out or press movements to cause the needle beards to engage the presser

ledge during the knitting of the leg and foot portions of the stocking blanks; a normally inactive supplemental presser mechanism including a pair of blade elements for engaging end groups of needles from behind in heel knitting, and normally quiescent means for actuating said members; means for modifying the press movement of the needle bar at the commencement of the heel tab knitting to prevent pressing of the instep needles and for initiating an operative phase of the blade element actuating means; and means for progressively and concurrently shifting the blade elements laterally outward relative to each other at definite intervals for a time and thereafter reversing the procedure to determine the formation of diagonally-sutured heel tabs.

12. In a straight stocking knitting machine, a needle bar with a series of spring beard needles; a presser ledge; means for imparting up and down movements to the needle bar; means for concurrently imparting in and out or press movements to cause the needle beards to engage the presser ledge in the knitting of the leg and foot portions of a stocking blank; a normally inactive supplemental presser mechanism including a pair of blade elements for engaging end groups of needles from behind in heel knitting, and normally quiescent means for actuating said elements; means for modifying the press movement of the needle bar at the commencement of the heel knitting to prevent pressing of the instep needles, and for concurrently initiating an operative phase of the blade element actuating means; and means for progressively and concurrently shifting the blade elements laterally outward relative to each other at definite intervals for a time, and thereafter reversing the procedure with lateral shifting of said blade elements at different intervals to determine the formation of diagonally-sutured heel tabs.

13. In a straight knitting machine, a bar with a series of spring beard needles; means for imparting up and down movements to the needle bar; a presser ledge; an element independently supported for capacity to rise and fall with the needle bar and adapted to engage a group of the needles from behind to urge them into contact with the presser ledge in stitch formation; means for actuating said member in timed relation with the movements of the needle bar; screw means for shifting said element laterally to operate upon different groups of the needles; and means for intermittently rotating said screw means.

14. In a straight knitting machine, a bar with a series of spring beard needles; a cam shaft; means motivated from the cam shaft for imparting up and down movements to the needle bar; a presser ledge; an element independently supported for capacity to rise and fall with said needle bar and adapted to engage a group of the needles from behind to urge them into contact with the presser ledge in stitch formation; means motivated from the cam shaft for actuating said element in timed relation with the up and down movements of the needle bar; and intermittently-operated shifting means also motivated from the cam shaft for shifting said element laterally to operate upon different groups of the needles.

15. In a straight knitting machine, a bar with a series of spring beard needles; a cam shaft; means motivated from the cam shaft for imparting up and down movements to the needle bar; a presser ledge; an element independently supported for capacity to rise and fall with said needle bar and adapted to engage a group of the needles from behind to urge them into contact with the presser ledge in stitch formation; means motivated from the cam shaft for actuating said element in timed relation with the up and down movements of the needle bar; intermittently-operated shifting means also motivated from the cam shaft for shifting said element laterally to operate upon different groups of the needles; and timing means for controlling the actuation of said shifting means from the cam shaft.

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