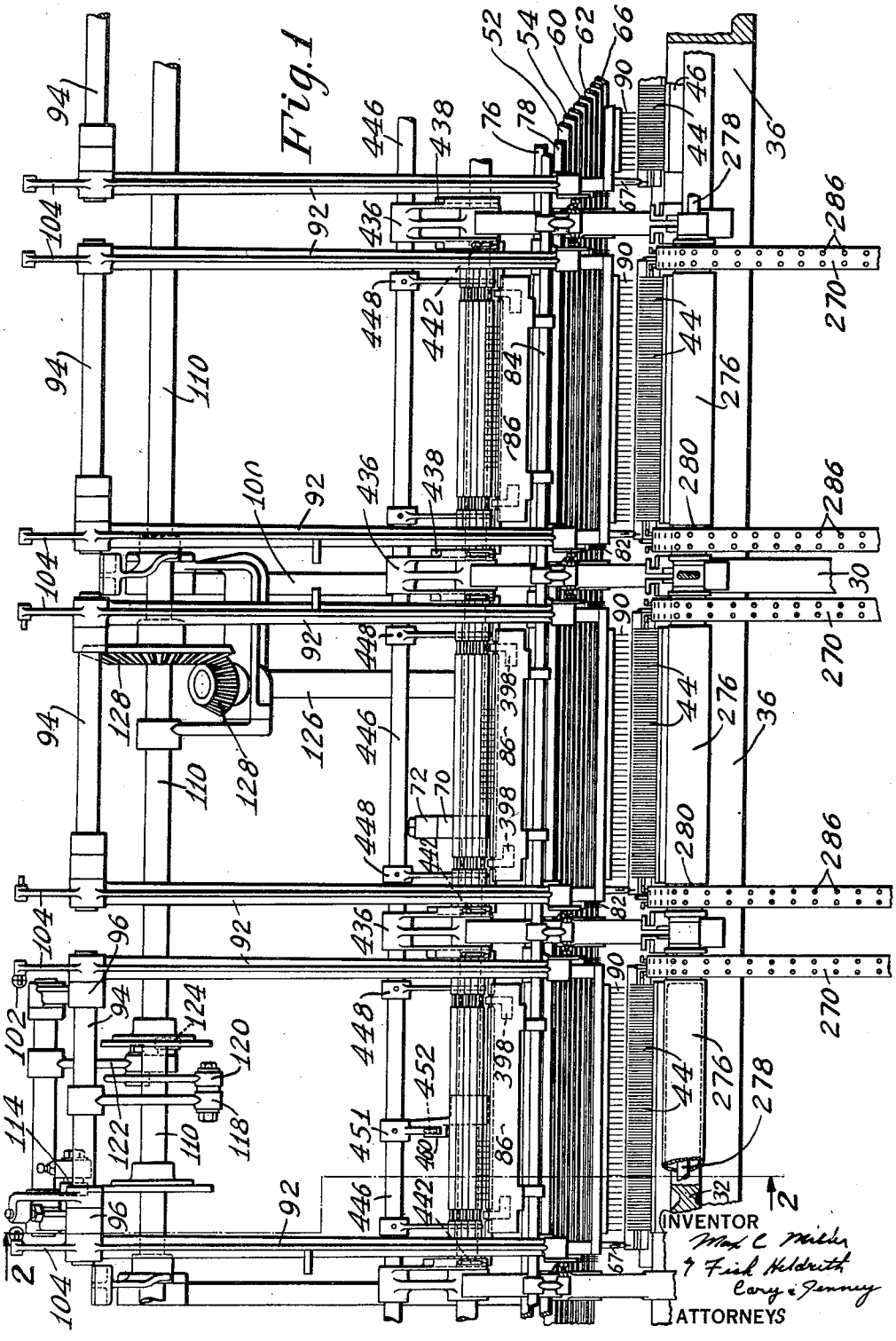
July 8, 1941. M. C. MILLER 2,248,507

KNITTING MACHINE

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Fig. 1

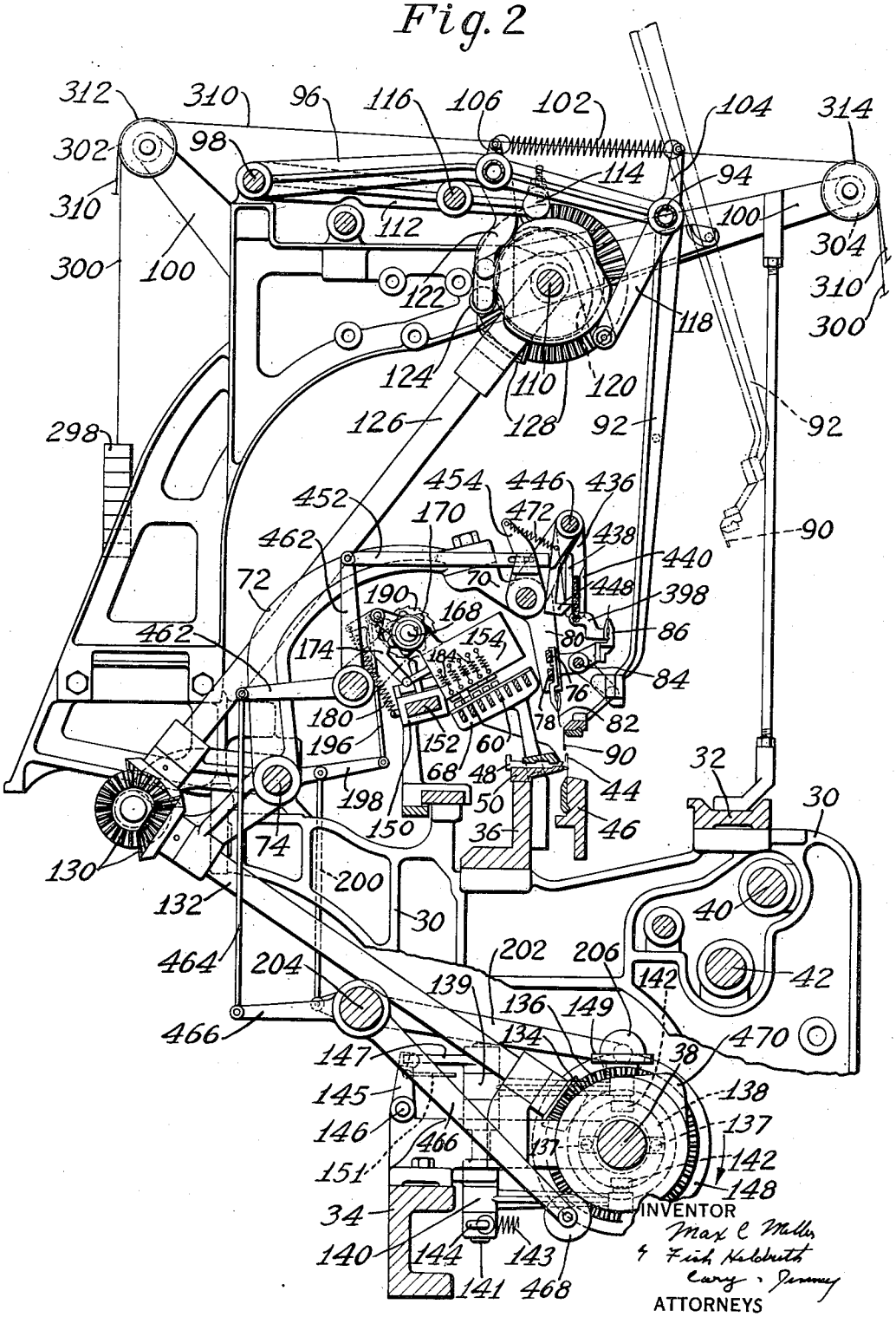


July 8, 1941. M. C. MILLER 2,248,507

KNITTING MACHINE

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Fig. 2

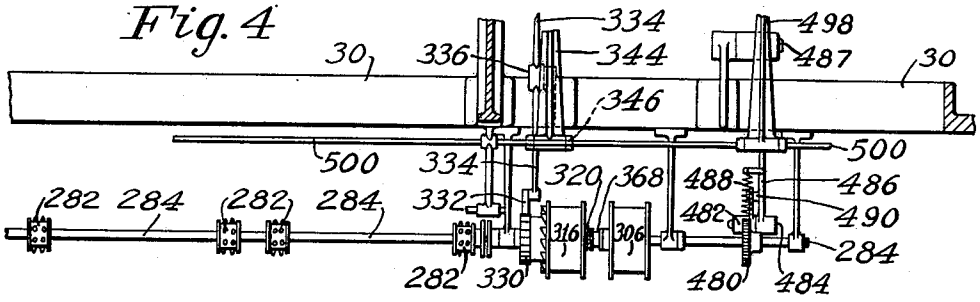


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KNITTING MACHINE

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Fig. 4



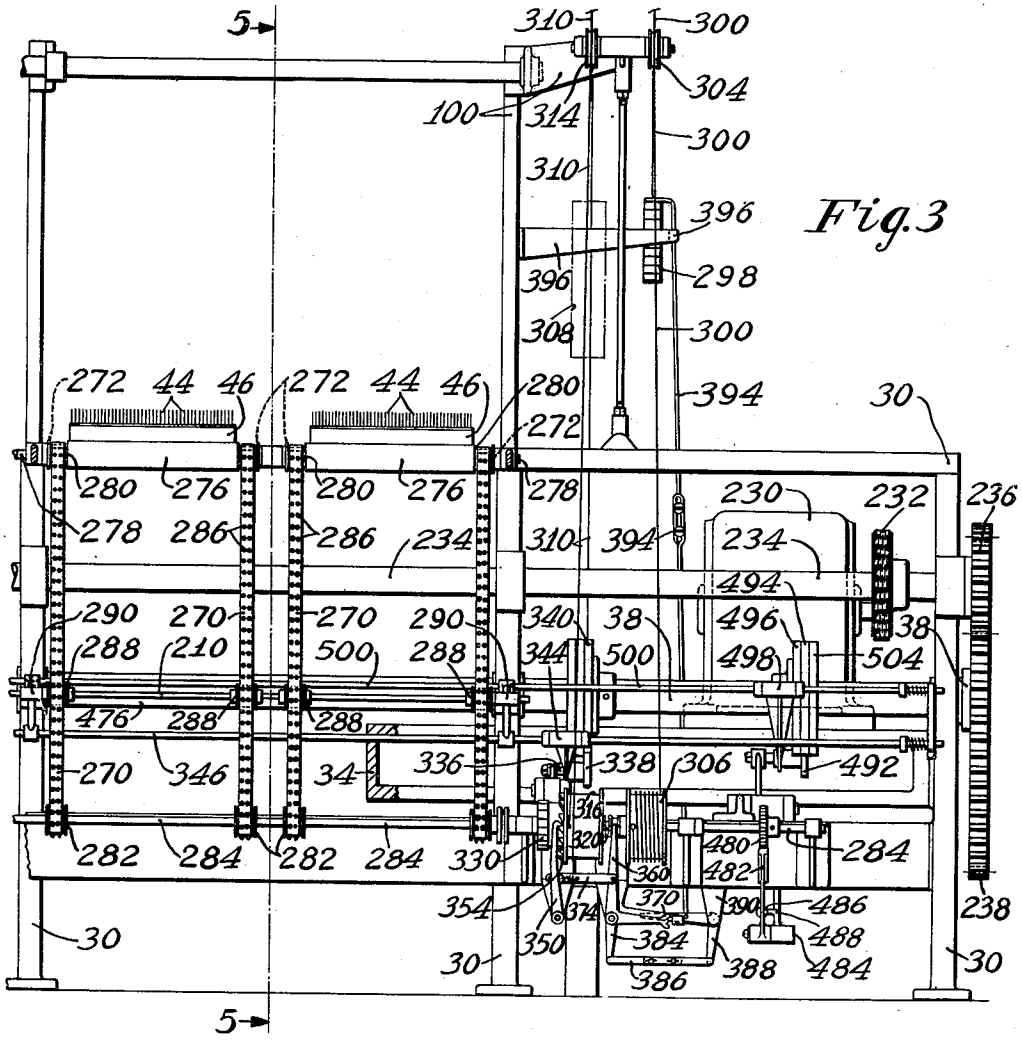


Fig. 3

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July 8, 1941. M. C. MILLER 2,248,507

KNITTING MACHINE

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Fig. 29

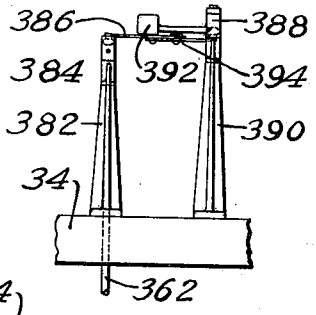
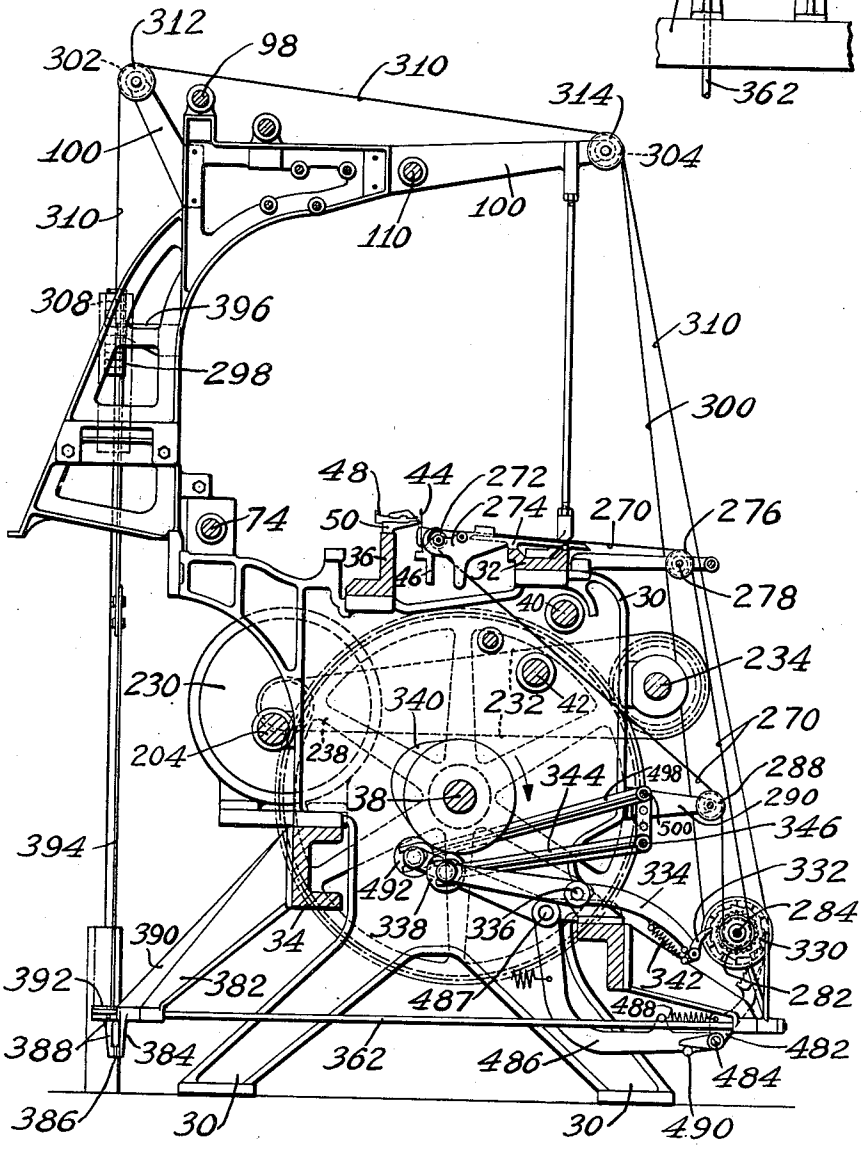


Fig. 5



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July 8, 1941. M. C. MILLER 2,248,507

KNITTING MACHINE

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Fig. 8

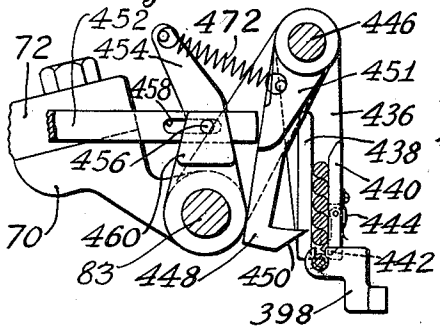


Fig. 7

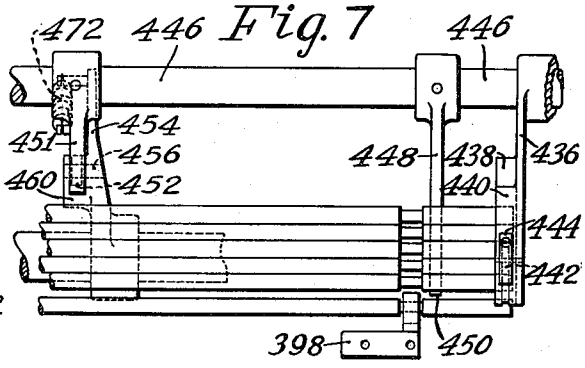


Fig. 10

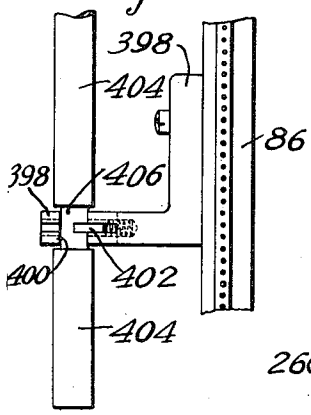
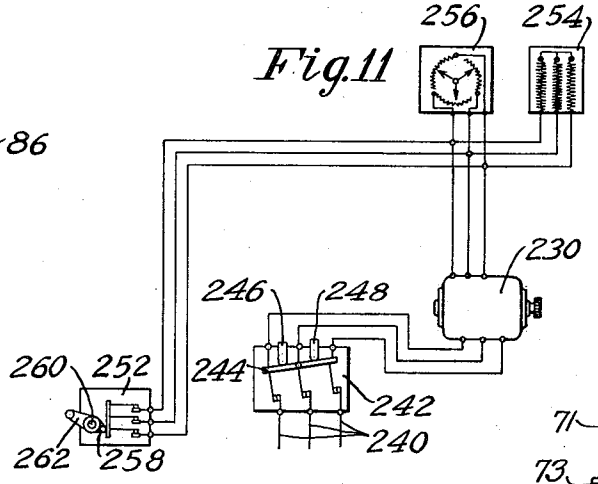


Fig. 11



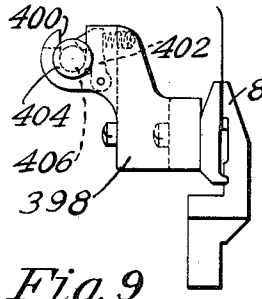
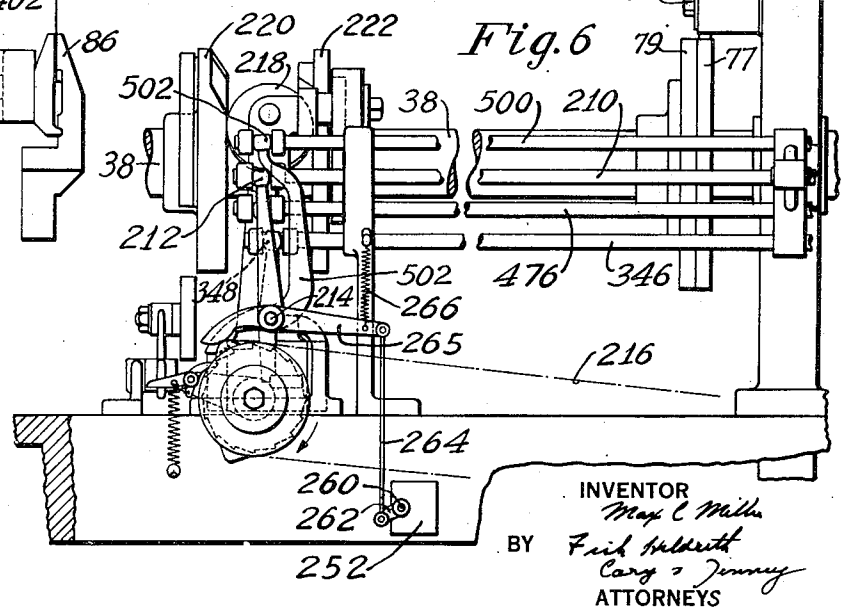
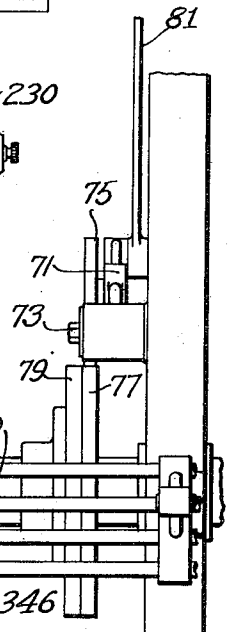


Fig. 9

Fig. 6





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Fig.15

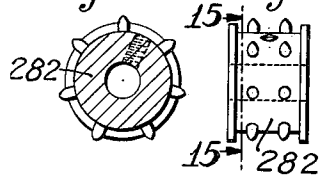


Fig.14

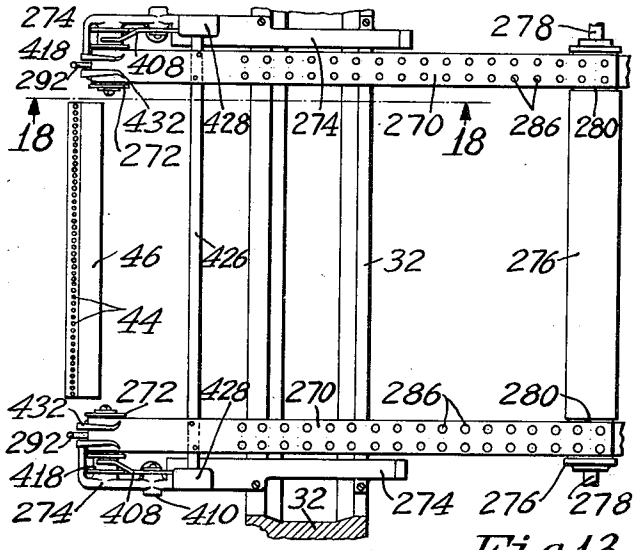


Fig.13

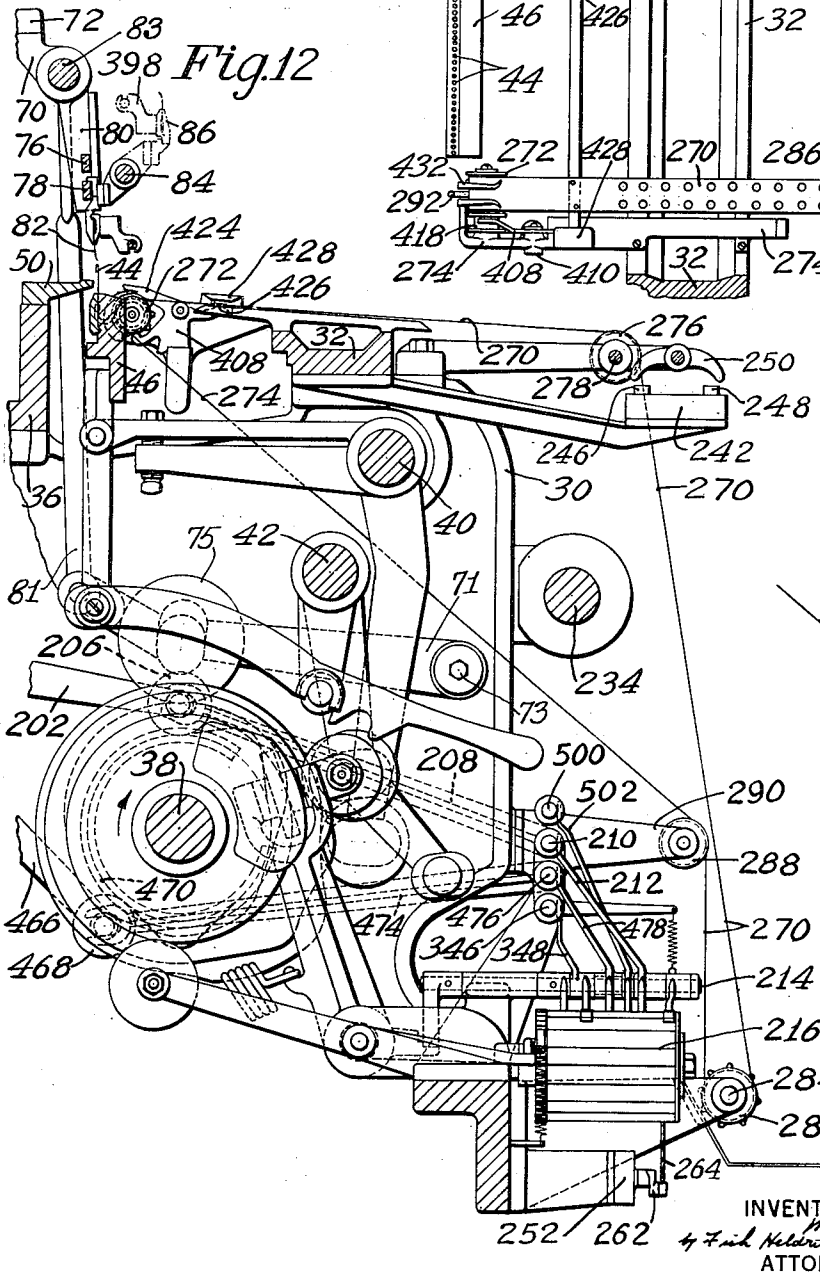
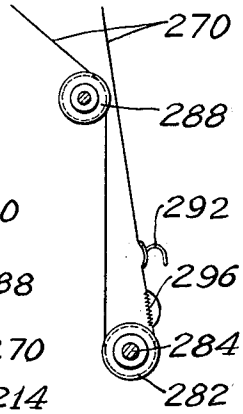


Fig.12

Fig.16



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July 8, 1941. M. C. MILLER 2,248,507

KNITTING MACHINE

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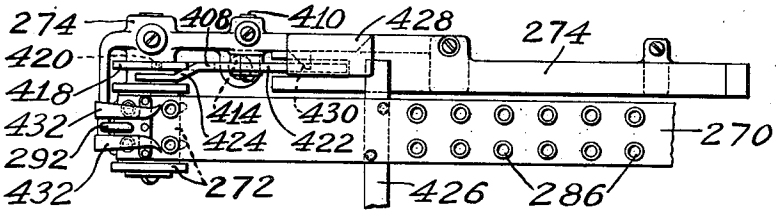


Fig.17

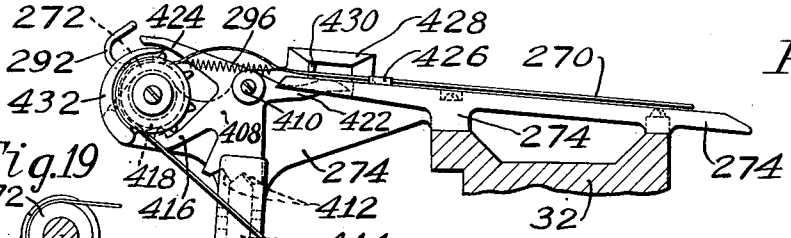


Fig.18

Fig.19

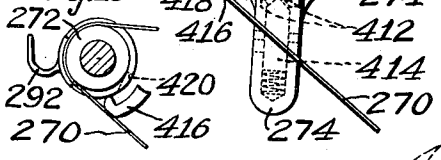


Fig. 20

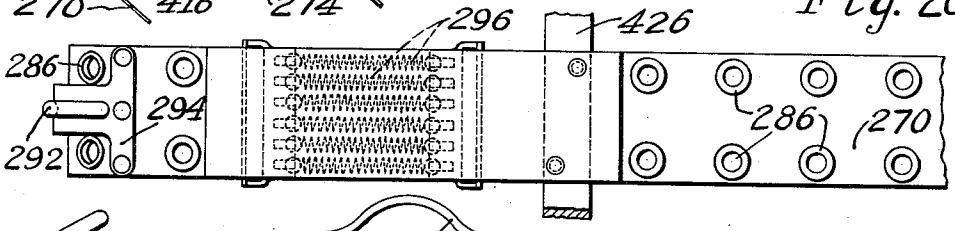


Fig. 21

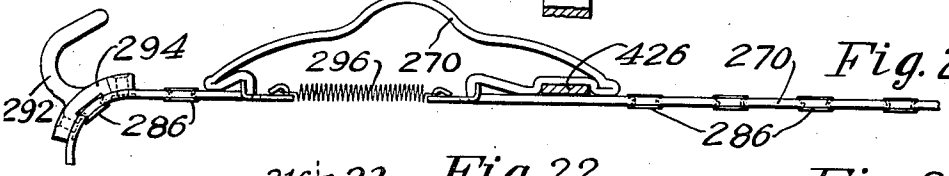


Fig. 22

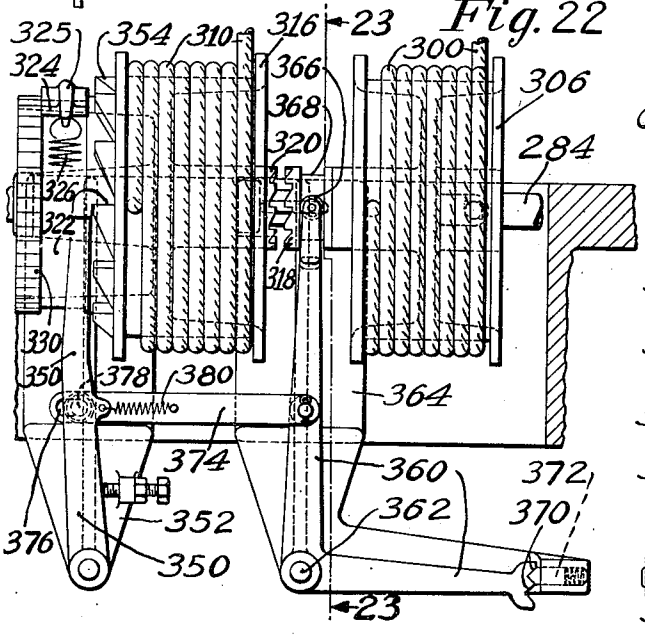
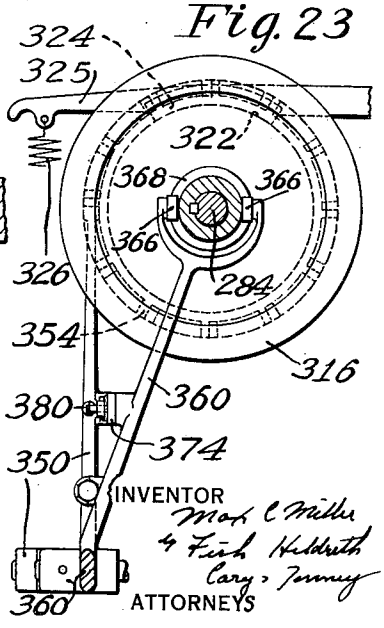


Fig. 23



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July 8, 1941. M. C. MILLER 2,248,507

KNITTING MACHINE

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Fig. 24

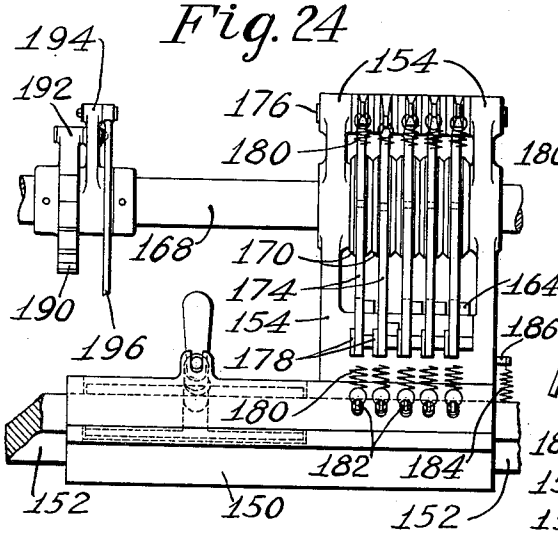


Fig. 25

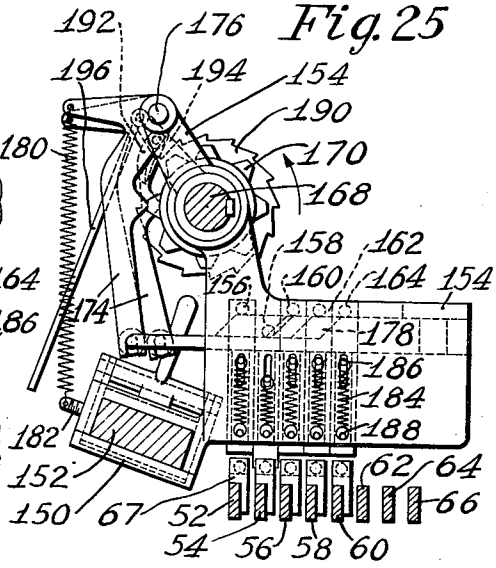


Fig. 27

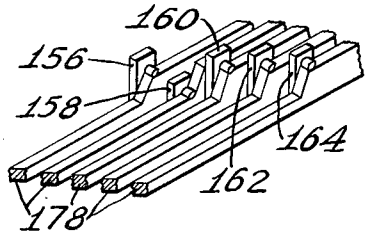


Fig. 26

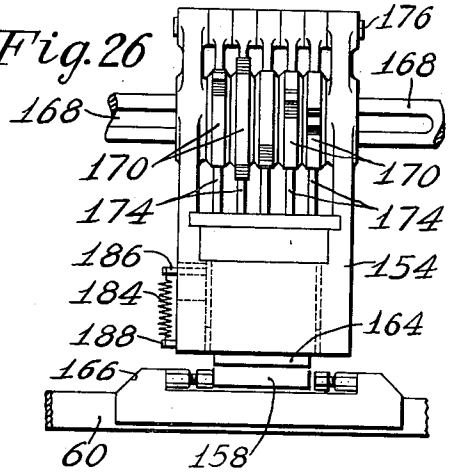
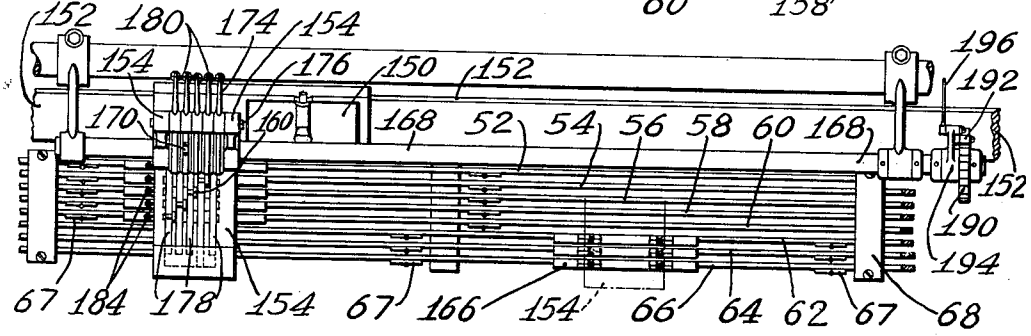


Fig. 28



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Patented July 8, 1941

2,248,507

UNITED STATES PATENT OFFICE

2,248,507

KNITTING MACHINE

Max C. Miller, Cumberland, R. I., assignor to Knitting Machines Corporation, a corporation of Delaware

Application November 12, 1938, Serial No. 239,984

87 Claims. (Cl. 66—82)

The present invention relates to improvements in flat knitting machines, and is herein disclosed as embodied in a flat full-fashioned type hosiery machine having welt mechanism arranged for mechanically setting up and subsequently closing the welt.

It is a principal object of the invention to provide in a flat knitting machine, a novel and improved construction and arrangement of the several cooperating instrumentalities together with the actuating and controlling devices therefor, which will adapt the machine for full automatic and continuous operation in the knitting of a succession of knitted articles upon the machine.

It is a further object of the invention to provide a flat full-fashioned type hosiery machine adapted for the knitting of welted fabrics which is constructed and arranged to automatically discharge each successively completed blank from the machine, and thereafter to set up and knit another welted fabric without interruption of the machine operation.

It is another object of the invention to provide in a flat knitting machine having knitting and fabric take-up devices, a novel construction and arrangement of the several cooperating mechanisms including means for automatically discharging each knitted article from the machine upon completion thereof, whereby said devices including the fabric take-up may be applied to the knitting of a succeeding article without interrupting continued operation of the machine.

It is another object of the invention to provide a flat knitting machine which is constructed and arranged for knitting, and thereafter for automatically pressing off the finished fabric.

It is another object of the invention to provide in a flat knitting machine adapted for knitting welted fabrics having knitting and fabric take-up devices including a welt wire, means for supporting a plurality of such welt wires on the machine, and for bringing said welt wires successively into active operation to take up in succession each article knitted on the machine.

It is another object of the invention to provide in a flat knitting machine for knitting welted fabrics, a novel and improved fabric take-up device including means for automatically resetting the take-up to receive a new welt wire, and for tensioning the same against the welt fabric.

With these and other objects in view as may hereinafter appear, the several features of the invention consist also in the devices, combinations and arrangement of parts hereinafter described and claimed, which together with the advantages to be obtained thereby will be readily understood by one skilled in the art from the following description taken in connection with the accompanying drawings, in which Fig. 1 is a view in front elevation of the upper portion of a flat full-fashioned type knitting machine having mechanical means to turn the welt, three sections of the machine being specifically shown in this figure; Fig. 2 is a sectional view of the machine looking from the left, taken substantially on the line 2—2 of Fig. 1, and illustrating additional details of the actuating connections for the welt mechanism, the automatic control for throwing the selected yarn carriers into and out of operation, and the mechanism for transferring a welt wire from the welt wire magazine to the welt wire support on the picot bar; Fig. 3 is a somewhat fragmentary view of the machine in front elevation illustrating particularly the machine drive, the fabric take-up and resetting mechanisms including the counterweights and operating controls therefor; Fig. 4 is a plan view of certain of the parts shown in Fig. 3; Fig. 5 is a cross sectional view of the machine looking from the left, and taken on the line 5—5 of Fig. 3; Fig. 6 is an enlarged detail view in front elevation illustrating particularly certain of the pattern controls of the machine and the cam shaft shift mechanism; Fig. 7 is an enlarged detail view in front elevation illustrating particularly the welt wire magazine shown in Fig. 1, and the welt wires supported therein; Fig. 8 is an end view looking from the left, of the parts shown in Fig. 7; Fig. 9 is an enlarged detail view in left side elevation illustrating particularly the picot bar and welt wire support shown in Fig. 2; Fig. 10 is a partial plan view of the parts shown in Fig. 9; Fig. 11 is a wiring diagram showing certain of the electrical connections including the main driving motor of the machine, and the slow-down and stop switches therefor; Fig. 12 is a cross-sectional view of the lower portion of the machine looking from the left, and incorporating substantially the parts shown in Fig. 6; Fig. 13 is a partial plan view of Fig. 2, illustrating particularly the needle bar and fabric take-up mechanism including the take-up straps and take-up supporting means associated with one knitting section of the machine; Fig. 14 is a detail view in front elevation of the driving roller for one of the take-up straps; Fig. 15 is a sectional view taken on the line 15—15 of Fig. 14; Fig. 16 is a detail view of a portion of the take-up straps shown in Fig. 12, but with the straps in the position taken at the time of pressing off of the

fabric; Fig. 17 is an enlarged detail plan view of a portion of one of the take-up straps and the latch mechanism associated therewith, shown in Fig. 13, the parts being shown in latched position; Fig. 18 is a view in side elevation of substantially the parts shown in Fig. 17; Fig. 19 is a detail sectional view of a portion of the latch mechanism for supporting the take-up shown in Fig. 18, but with the take-up strap and hooks associated therewith at the limit of their rearward or resetting movement prior to the engagement of the latch; Fig. 20 is a detail plan view showing in full size a portion of one of the take-up straps including the resilient section thereof; Fig. 21 is a view in side elevation of the parts shown in Fig. 20; Fig. 22 is an enlarged detail view in front elevation of the counterweight drums, the resetting clutch and certain of the control mechanisms associated therewith, shown on a smaller scale in Fig. 3; Fig. 23 is a sectional view taken on the line **23—23** of Fig. 22; Fig. 24 is an enlarged detail view in rear elevation of the automatic mechanism for driving and for throwing selected yarn carriers into and out of operation; Fig. 25 is a view in side elevation of the parts shown in Fig. 24, looking from the right of Fig. 24; Fig. 26 is a view in front elevation of certain of the parts shown in Figs. 24 and 25; Fig. 27 is a detail perspective view of the automatic yarn carrier control slides; Fig. 28 is a detail plan view illustrating the carrier rods and automatic yarn carrier mechanism extending over two sections of the machine; and Fig. 29 is a detail plan view of a portion of the control mechanism for the take-up resetting clutch shown in said elevation in Fig. 5.

The invention is herein disclosed as embodied in a flat full-fashioned machine of the general type which is adapted for continuous operation in the knitting of full-fashioned hosiery, only so much of the machine, however, having been illustrated, as necessary to show the connection of the present invention therewith. The machine is provided with mechanism for performing all of the operations essential to the knitting of a stocking blank, including the usual knitting devices and the several mechanisms required for performing the various operations auxiliary to knitting, including the usual narrowing machine frame, mechanism for the automatic changing of yarn carriers, and welt mechanism adapted for automatically setting up and subsequently turning the welt.

In accordance with the present invention, a novel and improved welt wire take-up mechanism is employed which is constructed and arranged to cooperate with the automatic yarn changer upon the completion of a knitted fabric to cast off and to discharge the completed blank from the machine, whereby the take-up is freed automatically from engagement with the completed blank and may be returned to operating position without interruption of the machine operation to set up and knit a new welted fabric.

In accordance with a feature of the invention, a novel and improved fabric take-up device is employed for drawing off the fabric during the knitting of the entire blank in linear directions, so that the completed fabric when pressed off, may be discharged from the machine.

In accordance with another feature of the invention, a novel mechanism is employed for mechanically resetting the fabric take-up, so that the take-up may be rendered operative during the subsequent knitting of a new welted fabric to provide a continuous take-up of the fabric during the knitting of the welt and subsequent leg portions of the blank.

Another feature of the invention consists in the novel and improved construction and arrangement of the welt wire support, fabric take-up connectible thereto, and actuating connections associated therewith, for causing a welt wire held on said support to be operatively connected with the fabric take-up to take up the welted fabric.

Another feature of the invention consists in the provision of a welt wire magazine, and means associated therewith for positioning welt wires from the magazine in the welt wire support.

Other features of the invention relate to the provision of a number of novel actuating and controlling mechanisms, and to the novel arrangement of these mechanisms for controlling the operation of the several instrumentalities of the machine to carry out individually and in series the several operations which include the slowing of the machine, the actuation of the automatic carrier mechanism to disconnect the active carrier and to press off a completed fabric blank, the arresting of the movement of the fabric take-up, the discharge of the blank and associated welt wire from the machine, the further actuation of the carrier mechanism and the welt hooks to throw a carrier into active operation to set up an initial course of welt fabric, the shifting of the machine to full speed operation, the resetting of the fabric take-up mechanism and subsequent automatic laying in and tensioning of a new welt wire from the magazine against the fabric, the slowing of the machine and movement of the welt hooks to close the welt, the easing of the take-up tension during said welt closing operation, and the shifting of the machine again to full speed operation for the continued knitting of the remaining portions of the blank in the usual manner.

The drawings disclose a multiple section flat full-fashioned type machine which is in many respects of well known construction, having the usual frames **30** spaced at intervals along the machine length, which are tied together by a number of rails extending along the length of the machine, these rails as best shown in Fig. 2, including a work table **32**, lower rear rail **34**, and sinker rail **36**. Supported in bearings in the frames **30** are a number of operating shafts which extend along the length of the machine including the usual main cam shaft **38**, the needle forward and back motion rock shaft **40** and the needle vertical motion rock shaft **42**. The machine is provided with the usual knitting instrumentalities including knitting needles **44** supported in needle bars **46**, sinkers **48** and the usual alternating dividers slidably supported in sinker bed **50** which has formed at its forward end the usual press edge, and cooperating knock-over bits (not shown).

The machine is also provided with the usual yarn carrier rods designated respectively at **52**, **54**, **56**, **58**, **60**, **62**, **64** and **66** supporting yarn carriers **67**, these rods extending along the length of the machine, and being supported in brackets **68** secured to the sinker rail **36**. The machine is also provided with the usual narrowing machine frame comprising a rod support **70** extending along the length of the machine and rigidly supported along its length on forwardly extending arms **72** which are pivotally supported on a pivot shaft **74**. The illustrated machine is provided with narrowing rods, two such rods only

being shown for convenience of illustration at 76 and 78 slidably supported in downwardly extending brackets 80 on the rod support 70 of the narrowing machine, and having secured thereto the usual narrowing fingers 82. Also supported on the brackets 80 is a picot rod 84 having mounted thereon the usual picot bars 86, the bars 86 being pivotally supported on the rod 84 being swung between an inoperative raised position, as shown in Figs. 2 and 9, and an alternative downward operating position, as shown in full lines in Fig. 12.

The machine is also provided with the usual mechanism for imparting to the narrowing frame the dipping movements employed for narrowing and similar loop transfer operations. This mechanism, as best shown in Figs. 6 and 12, comprises one or a plurality of cam levers such as that indicated at 71 supported at its forward end on a pivot stud 73, and provided with a cam roller 75 for alternate engagement with an idler cam disk 77 and an adjacent narrowing cam 79. At its rear end, the cam lever 71 is connected by a vertically extending link 81 to the narrowing frame comprised by arms 72, a rod support 70, and the connecting rod designated at 83. In accordance with the usual practice, the cam shaft 38 is arranged to be shogged to the right to narrowing position to position the narrowing cam 79 in operative relation to the cam roller 75. By the term "dummy narrowing motion", as used in the specification and claims, is meant the shogging of the cam shaft 38 to its narrowing position, so that the usual narrowing dipping motions are imparted to the narrowing frame as above set forth, while the narrowing points are either rendered inoperative or are located in inoperative position beyond the ends of the active needle series. During this dummy narrowing motion, the machine is operated at a reduced speed in accordance with the universal practice of slowing the machine operation when the narrowing machine is functioning.

The welt mechanism of the present machine is substantially identical with that illustrated in the copending application of Lieberknecht Serial No. 212,088, filed June 6, 1938, and comprises welt hooks 90 supported on pendants 92 secured to overhead pivot shafts 94 which are in turn mounted for vertical movement on forwardly extending lever arms 96. The supporting lever arms 96 are sleeved at their rear ends on a longitudinal pivot shaft 98 rotatably mounted in bearings formed in upwardly extending brackets 100. The welt hooks 90 and pendants 92 are tensioned forwardly to provide a take-up tension during the knitting of the welt fabric, by means of tension springs 102 connected between upwardly extending arms 104 on the pendants 92, and pins 106 on the supporting lever 96. The forward and back and vertical positioning movements are imparted to the pendants 92 and welt hooks 90 to take a setting-up course of needles, and subsequently to return these loops to the needles to close the welt through operating connections which include an auxiliary cam shaft 110 rotatably supported in the overhead brackets 100, and having mounted thereon forward and back and vertical motion cams. The connections through which vertical positioning movements are imparted to the pendants 92 and welt hooks 90 comprise forwardly extending cam levers 112 loosely supported at intervals along the length of the machine on the shaft 98, and provided at their forward ends with cam engaging rollers 114. The cam levers 112 are connected together by means of a longitudinally extending rod 116, and engage beneath the forwardly extending supporting levers 96 to determine the vertical position thereof. The connections through which forward and back movements are imparted to the pendants 92 and welt hooks 90 comprise downwardly extending lever arms 118 rigidly secured to the rock shafts 94 on which the pendants 92 are secured. Each of the levers 118 is connected by a link 120 to a cam lever 122 pivotally mounted on a forwardly extending lever arm 96, and provided at its lower end with a roller 124 for engagement with a cooperating cam on the auxiliary cam shaft 110. In accordance with the disclosure of the above-mentioned Lieberknecht application, the auxiliary cam shaft 110 is driven through successive one-half revolutions to effect each of the setting-up and subsequent welt closing operations through connections from the main cam shaft of the machine, which include a driving rod 126 connected at its upper end through bevel gears 128 with the cam shaft 110, and at its lower end through bevel gears 130 with a second drive shaft 132. At its lower end the shaft 132 is provided with a bevel gear 134 which meshes with a driving bevel gear 136 loosely supported on the main cam shaft 38 of the machine. The driving gear 136 is driven through successive increments of one-half revolution each, through a half revolution clutch, which is in turn controlled from the pattern chain of the machine for the actuation of the welt mechanism.

The clutch comprises a sleeve clutch member generally indicated at 138 (Fig. 2) slidably supported on the sleeve hub of and keyed by pins 137 to turn with the driving bevel gear 136. The clutch member 138 is moved into and out of clutching engagement with a driving clutch member secured to the cam shaft 38 through connections which include clutch shifting levers 139 and 140 secured to a vertically extending rock shaft 141, and provided at their forward ends with follower rolls 142 arranged to engage with an annular groove formed in the periphery of the slidable clutch member 138. A tension spring 143 connected to a laterally extending arm 144 on the lower end of the vertical rock shaft 141 tends to move the clutch member 138, which is of the single tooth type, into clutching engagement with the driving clutch member referred to. The clutch member 138 is however held normally in a retracted inoperative position by the engagement of a vertically extending detent lever 145 carried on a fixed pivot 146 with a rearwardly extending arm 147 secured to the upper end of the vertical rock shaft 141. Upon movement of the detent lever 145 rearwardly out of engagement with the cooperating arm 147, the clutch member 138 will be moved under the pressure of its spring 143 into clutching position. After the main cam shaft 38 has rotated through a partial revolution, and when the welt cam shaft 110 has turned through substantially one-half revolution, the clutch member 138 is again moved to its inoperative position to disconnect the drive to the welt cam shaft 110 by engagement of a face cam on a disk 148 on the cam shaft 38, with a roller 149 on the clutch lever 139. The detent lever 145 then moves behind the arm 147 to lock the clutch in disengaged position.

The operation of the detent 145 to engage the part revolution clutch for each of the setting up and subsequent welt closing operations of the welt mechanism, is controlled from the pattern chain

216 of the machine through suitable connections including a pattern lever which may be of ordinary construction to be actuated by a button on the chain, and link connections terminating in the link 151 connected at its rear end to the detent lever 145.

Inasmuch as the parts of the machine thus far described, are either well known in the art, or have been more fully described and illustrated in the pending Lieberknecht application above referred to, and inasmuch as the details of these mechanisms form no part of the present invention, further illustration thereof is believed unnecessary.

An automatic mechanism for driving and for throwing selected carrier rods into and out of active operation, is illustrated in Figs. 2 and 24 to 28 inclusive, for controlling the carrier rods 52 to 60 inclusive. This mechanism comprises a friction box 150 supported on the traversing friction carrier driving rod 152. Rigidly secured to move with the friction box, is a support 154 having mounted thereon vertically slidable driving members 156, 158, 160, 162 and 164 which are arranged for engagement with corresponding stops generally indicated at 166 on the respective carrier rods 52 to 60 inclusive. The bracket support 154 is also sleeved for axial movement upon a pattern shaft 168 which provides support for five pattern cams generally designated at 170 which operates through intervening connections to control the positions of the respective driving members 156 to 164 inclusive. The pattern cams 170 are slidably mounted upon and keyed to turn with the pattern shaft 168, and are mounted between upwardly extending arms of the bracket 154 to move as a unit with the bracket and friction box 150 lengthwise of the machine. The connections through which the pattern cams 170 are rendered operative to control the positions of the driving members 156 to 164 inclusive, comprise a series of pattern levers 174 supported on a pivot shaft 176 on the upper portion of the bracket support 154 for engagement with the respective pattern cams 170, and connected at their lower ends to forwardly extending slide members 178 supported in the bracket support 154. Each of the slides 178 has formed thereon a cammed rise portion which engages with a transverse pin on the corresponding driving members 156 to 164 inclusive. Tension springs 180 which are connected at their upper ends to the pattern levers 174 and at their lower ends to pins 182 on the friction box 150, tend normally to maintain each of the pattern levers 174 and associated slides 178 in a forward position in which each of the driving members 156 and 164 inclusive, are permitted to fall into locking engagement with corresponding abutments 166 on the respective carrier rods. Small tension springs 184 connected between pins 186 on the respective driving members 156 to 164 inclusive, and pins 188 on the bracket support 154, tend to move the respective driving members downwardly to operating position. Step-by-step rotational movements are imparted to the pattern shaft 168 and pattern cams 170 to cause selected carriers to be thrown into and out of active operation by means of a pawl and ratchet racking device which is actuated in timed relation to the main cam shaft 38 of the machine. These connections, as best shown in Figs. 2 and 24, include a ratchet 190 secured to the pattern shaft 168, and a pawl 192 mounted on a pawl lever 194 loosely supported to turn on the pattern shaft 168. The pawl lever is connected by means of a link 196 to the outer end of a lever 198 loosely supported to turn on the pivot shaft 74. The lever 198 is in turn connected by means of a link 200 to the rearwardly extending arm of a cam lever 202 supported on a pivot shaft 204, and provided at its forward end with a cam roller 206 for engagement with an actuating cam on the main cam shaft 38 of the machine. The roller 206 is supported for axial sliding movement on its pivot to permit movement of the roller into and out of operative engagement with its cooperating cam. Shifting movements are imparted to the cam roller 206 through connections, best shown in Figs. 6 and 12, controlled by the pattern chain 216 of the machine, which include a shifting fork 208 connected at one end to the grooved hub of the roller 206, and at its other end to an axially movable pattern link 210. Axial shifting movements are imparted to the pattern link 210 by means of a pattern lever 212 supported on a pivot 214, and arranged for engagement with corresponding buttons on the pattern chain 216.

The machine is provided with the usual cam shaft shift mechanism for rendering the narrowing machine operative and inoperative, as generally indicated in Fig. 6, including the shift roller 218 and cooperating face cams 220 and 222. The mechanism through which this cam shaft shift mechanism is controlled from the pattern chain 216 of the machine, being of well known construction, is not here shown.

The machine is driven from a variable speed electric motor generally indicated at 230 in Figs. 3 and 11. The drive is taken from the motor 230 through a chain 232 to the usual hand wheel shaft 234 extending along the front side of the machine. The shaft 234 is connected to drive the cam shaft 38 through one or more gears 236 secured to the shaft 234 which mesh with gears 238 on the cam shaft 38. The starting and stopping and variation in the rate of machine operation are controlled through electrical connections which may be rendered operative to start and stop and to vary the speed of the motor 230. The construction and mode of operation of these connections will be readily appreciated from an inspection of the electrical diagram of Fig. 11, in which power is supplied to the motor 230 from a three phase power line 240. A main starting and stopping switch is shown at 242 comprising a pivoted switch contact member 244 controlled by plungers 246 and 248 which are in turn acted upon by a rocker arm 250 (see Fig. 12) secured to the usual manually operable control shaft extending along the front side of the machine.

For slowing the motor to a predetermined slow speed, there is also provided a motor slow switch 252 arranged for the closed position shown in Fig. 11, to short-circuit two motor slow speed resistors which include a fixed resistor 254 and a variable resistor 256. When the switch 252 is now thrown to the alternative slow speed open position, the resistors 254 and 256 are rendered operative to slow the motor to a predetermined slow speed determined by the setting of the variable resistor 256. It will be understood that the electrical connections for controlling the motor 230 may be of any well known description, and do not form specifically any part of the present invention. No further description thereof is believed necessary. The motor slow switch 252 comprises a contact arm 258 pivotally mounted on a rock shaft 260 which also carries an arm 262 connected through a link 264 (see Fig. 6)

with a pattern chain lever 265. A tension spring 266 connected at one end to the pattern lever 265 and at its other end to a fixed part of the machine, tends normally to hold the pattern lever and switch contact arm 258 in the closed high speed position illustrated in Fig. 11.

In accordance with the present invention, mechanism has been provided adapted for use in flat knitting machines of the general type herein disclosed, for effecting automatic press-off of the finished fabric, and the subsequent starting of a new set on the machine without any necessity of interrupting machine operation. In the preferred construction illustrated in the drawings, applicant provides a fabric take-up mechanism which is constructed and arranged to automatically discharge the finished fabric from the machine, and thereafter automatically to be brought into position for engagement with a new set for the performance of its take-up function. As disclosed in the drawings, the fabric take-up mechanism has been particularly adapted to cooperate with means for mechanically turning the welt, for the taking up and subsequent discharge of welted fabrics from the machine. As previously stated, features of applicant's take-up mechanism include a welt wire magazine, a support on which welt wires are supplied as needed from the magazine, and means for imparting relative movements to the take-up and support to operatively connect the welt wire with the take-up to take up the welted fabric.

As best shown in Figs. 3 and 12 of the drawings, there is provided with each section of the machine, a pair of endless take-up straps 270 which are supported adjacent the needle series on idler rollers 272 in the form of pin sprockets which are pivotally supported on bridges 274, two such bridges being provided for each section at opposite sides of the needle series. The straps 270 extend forwardly around an idler take-up roller 276 loosely mounted on a shaft 278 which extends lengthwise of the machine, and occupies the position of the usual fabric take-up shaft of these machines, the straps 270 being mounted to run in grooved portions 280 formed at the opposite ends of the roller 276. Thence the straps extend downwardly around pin sprocket rollers 282 rigidly secured to a take-up shaft 284 extending along the length of the machine, and located near the floor level. It will be noted that each of the straps 270 is provided with a double series of grommets 286 for engagement with the pin sprocket rollers 272 and 282. Thence the straps 270 extend upwardly around idler rollers 288 supported on fixed brackets 290, and back to the idler pin sprocket rollers 272. As best shown in Figs. 20 and 21 of the drawings, each take-up strap 270 is provided with a welt wire take-up hook 292 having an arcuate-shaped base portion 294 secured to the strap 270. Each strap 270 has also provided therein, a resilient portion formed by a series of parallel tension springs 296 connected at opposite ends to portions of the strap 270, so that the intervening portion of the strap 270 is puckered around the springs. A take-up tensioning strain is imparted to the take-up straps 270 by means of a take-up counterweight 298 located at the right-hand end of the machine and supported by a counterweight cord 300 which passes over idler pulleys 302 and 304 located on the super-structure 100, and at its other end is secured to a counterweight drum 306 rigidly secured to the right hand end of the take-up shaft 284 at the right hand end of the machine. The idler sprocket pin rollers 272 and the take-up pin sprocket rollers 282 are connected to the take-up straps 270 in such a manner as to provide a sufficient amount of slack in the return side of the take-up straps passing around idler pulleys 288, so that the resilient portions of the straps comprised by the springs 296, may be free to contract and expand under the influence of the take-up tension acting against the knitting fabric.

Cooperating with the fabric take-up mechanism, there is provided with each section of the machine immediately beneath the driving take-up shaft 284 and pin sprocket take-up rollers 282, a hopper 307 which is rigidly secured to the supporting brackets for the take-up shaft 284, and extends along the length of the knitting section. This hopper is provided for the purpose of receiving the completed fabric blank and associated welt wire when the fabric is automatically pressed off, as hereinafter more fully to be described.

In accordance with the present invention, there is provided mechanically operating means for resetting the take-up straps 270 and counterweight 298. The mechanism provided to this end comprises a relatively heavier counterweight 308 which is supported on a counterweight cord 310 passing over idler pulleys 312 and 314, and thence downwardly to a counterweight drum 316 loosely supported to turn on the take-up shaft 284. A clutch member 318 keyed to the take-up shaft 284 and slidable thereon for engagement with a cooperating clutch member 320 formed on the hub portion of the resetting counterweight drum 316, provides a convenient means for connecting and disconnecting the resetting counterweight drum 316 and weight 308 to reset the take-up. It will be noted that the drums and the associated counterweight cords are arranged to rotate the take-up shaft 284 in opposite directions. In order to control the rate of movement of the take-up shaft 284 and associated parts under the influence of the resetting counterweight 308, there is also provided integral with the resetting counterweight drum 316, a friction brake which comprises a drum brake surface 322 against which a friction shoe 324 is tensioned by means of the lever 325 and spring 326.

The mechanism through which the resetting drum 316 and counterweight 308 are returned to the high set position shown in Fig. 3, comprises a ratchet 330 secured to turn with the drum 316 (see Figs. 5 and 22), and a pawl 332 pivotally mounted on a cam actuated pawl lever 334 supported on a fixed pivot 336. At its rear end the pawl lever 336 is provided with a laterally shiftable roller 338 which is arranged for engagement with a cam 340 on the cam shaft 38 of the machine. A small tension spring 342 connected at one end to the tail of the pawl 332 and at its other end to the lever 334 tends to maintain the pawl in engagement with the ratchet 330. The roller 338 is shifted into and out of operative engagement with its operating cam 340 to render the pawl and ratchet mechanism operative and inoperative through connections controlled from the main pattern chain 216 of the machine, which include a shifter fork 344 mounted on an axially movable control rod 346, and arranged for engagement with a grooved hub of the cam roller 338. As best shown in Fig. 6 of the drawings,

the control rod 346 is connected at its left hand end to an upwardly extending arm of a pattern lever 348 which is arranged to be acted on by appropriate buttons on the pattern chain 216.

In order to prevent reverse movement of the drum 316 under the influence of the counterweight 308 while the pawl and ratchet resetting mechanism above described, is in operation, and also for maintaining the counterweight 308 in its raised set position, a latch member 350 is provided pivoted at its lower end on a fixed bracket 352, and at its upper end arranged for engagement with the teeth of a stop ratchet 354 formed on the left face of the drum 316 as viewed in Fig. 22.

Further in accordance with the present invention, a control mechanism is provided which is rendered operative at the completion of a set upon the machine, to shift the clutch 318 from its inoperative position shown, for example, in Fig. 22, into engagement with the clutch member 320, and at the same time release the latch 350, so that the resetting drum 316 and counterweight 308 are rendered operative to rotate the take-up shaft 284 in a reverse direction, so that the take-up hooks 292 may be returned to operative position for engagement with the new welt wires, and the take-up counterweight 298 will be simultaneously moved to its raised set position. As best shown in Figs. 22 and 23 of the drawings, the position of the clutch 318 is controlled by means of a clutch lever 360 secured at its lower end to a rearwardly extending rock shaft 362 which is supported at its forward end on a fixed bracket 364. The lever 360 is provided at its upper end with a forked portion and shoes 366 which engage in a grooved portion 368 of the clutch member 318. A laterally extending arm of the clutch lever 360, has formed therein two V-shaped stop surfaces 370 which are arranged to be engaged by a spring-pressed detent 372 mounted on an extension of the bracket 364, so that the clutch lever may be held securely in each of its alternative disengaged and engaged positions. The position of the latch member 350 is arranged to be controlled from the reversing lever 360 by means of a link 374, at one end pivotally connected to the clutch lever 360, and at its other end having a slotted portion 376 to receive a pin 378 supported on the latch lever 350. A small tension spring 380 connected between the latch lever 350 and the link 374, tends to maintain the latch 350 at the limit of its movement to the right, as shown in Fig. 22. The positions of the clutch 318 and clutch lever 360 are directly controlled by the movement of the counterweight 298, movement of the counterweight 298 to its bottom position serving to shift the clutch to the left to connect the take-up resetting mechanism, and subsequent movement of the counterweight 298 to its fully raised position serving to return the clutch to its inoperative position shown in Fig. 22. These connections, as best shown in Figs. 3 and 5, comprise the rock shaft 362 which is supported adjacent its rear end in a bearing formed in a fixed bracket 382. A downwardly extending arm 384 secured to the rear end of the rock shaft 362 is connected by means of an adjustable link 386 with the downwardly extending arm of a bell-crank 388 pivotally supported on a machine bracket 390. A horizontal arm of the bell-crank 388 has formed thereon a pan 392 against which the counterweight 298 engages at the limit of its downward movement. The rocking movement thus imparted to the bell-crank 388, acts through the connections above described, to shift the clutch member 318 to the left to its engaged resetting position, and then, as the clutch members are brought into mesh, causes the latch 350 to be moved away from the stop ratchet 354. It is to be noted that the latch is not fully disengaged from its teeth until after the clutch has commenced to mesh. The release of the reset counterweight 308 and drum 316 as above described, causes the take-up shaft 284 to be rotated in a reverse direction to reset the take-up, and at the same time to move the take-up counterweight 298 to its raised position shown in Fig. 3. As the counterweight 298 reaches the limit of its upward movement, it engages with the offset upper end of an adjustable link 394 which is guided at its upper end in a stationary bracket 396, and at its lower end is pivotally connected to the horizontally extending arm of the bell-crank 388. The upward movement of the take-up counterweight 298 acts through the link 394 and bell-crank 388 to shift the clutch 318 again to its disengaged position, and at the same time acts yieldingly through the spring 380 to engage the latch 350 with the ratchet teeth to prevent further movement of the reset counterweight 308 and drum 316. The lost motion connection between the latch 350 and link 386 permits the latch to move freely back and forth under the influence of its spring during the re-winding of the resetting counterweight cord.

Further in accordance with the present invention, a novel and improved means is provided to support the welt wire take-up in operative position, to operatively engage a welt wire with the take-up, and to tension the welt wire against the welt portion of the fabric. To this end the welt wire is mounted on a support which is automatically moved downwardly to trip the take-up into active operation, and to engage the welt wire in the welt hooks 292.

In accordance with another feature of the invention, applicant provides a welt wire magazine, in which a relatively large number of welt wires may be stored, together with automatically operated means for transferring welt wires as needed from the magazine to the support, so that a continuous operation of the machine may be secured to set up and knit a succession of welted fabrics without any necessity on the part of the operator of laying in or placing additional welt wires on the machine during or prior to the knitting of each succeeding set.

As best shown in Figs. 2, 8, 9, 10 and 12 of the drawings, there is supported on each picot bar 86, a welt wire support which comprises two brackets 398, one at each end of the picot bar, having formed therein a slotted portion 400, and a spring-pressed detent 402 for yieldingly maintaining a welt wire in the support. It will be noted that the welt wire designated at 404 is provided near each end thereof with a reduced annular portion 406 which fits into the slot 400 in order to insure an accurate positioning of the welt wire lengthwise of the needle series. It will be noted that for the raised inoperative position of the picot bar shown in Fig. 9, and in dot-and-dash lines in Fig. 12, that the open ends of the slots 400 are positioned upwardly to permit the deposit of the welt wire therein. In the alternative operative position of the picot bar 86, the slots 400 open downwardly, the welt wire 404 being, however, held in position by the spring-pressed detents 402. The construction and ar-

rangement of the supporting means for the welt wire take-up is such that a dummy downward movement imparted to the narrowing machine frame with the picot bar in its downward operative position, will cause a welt wire held in the supporting brackets **398** to be positioned in the path of the take-up hooks **292**, and will then trip the welt wire take-up into active operation, causing the hooks **292** to strip the welt wire **404** from the slots **400**, and to tension the welt wire against the fabric.

The mechanism for supporting and for releasing the welt wire take-up comprises a pair of latch members **408** for each section, one such latch member being pivotally supported at **410** on each of the bridges **274**. The downwardly extending portion of each latch **408** has formed therein two V-shaped notches **412** which are arranged to be engaged by a spring-pressed plunger **414** in the bridge **274**, so that the latch member is held yieldingly in either of two alternative positions. The latch member **408** also has formed thereon a rearwardly extending latch arm **416** which is arranged to ride upon the peripheral surface of a disk member **418** secured to turn with the idler strap pulley **272**, and for engagement with a notch **420** formed in the surface of the disk. The latch member **408** is also provided with a forwardly extending arm **422** by means of which the latch is tripped into locking position, and a rearwardly extending arm **424**, by means of which the latch is tripped into its alternative open position to permit the movement of the welt hooks to engage with and tension the welt wire against the fabric. The mechanism for tripping the latch member **408** into latching position, comprises a cross bar **426** secured to and connecting the two take-up straps **270** of each section which is arranged as the take-up is drawn rearwardly to its set position, to ride on the bridges **274**. As the take-up approaches its extreme rearward position, the cross bar **426** rides under two cover plates **428** mounted on the respective bridges directly above the contact surface of the trip arm **422** of the latch, so that movement of the cross bar **426** beneath the bridge **274** acts to depress the arms **422**, and to shift the latches **408** sufficiently towards the latched position shown in Fig. 18, so that the spring-pressed plungers **414** start to enter the right hand notches **412**. Further movement of the latches is prevented at this time by the engagement of the latch arm **416** with the peripheral surface of the disk **418** as shown in Fig. 19. The cover plates **428** are also provided with a laterally extending stop surface **430** which engages against the bar **426** to positively limit the rearward movement of the take-up under the influence of the relatively heavy reset counterweight **308**. As the reset counterweight **308** and reset drum **316** are now disconnected through the opening of the clutch **318** as above described, the take-up straps **270** again move forwardly under the influence of the take-up counterweight **298** until the latch comes into engagement with the notch **420**. The action of the spring-pressed plunger **414** riding on the side of the right hand V-shaped notch **412**, now causes the latch to ride into the notch **420** to lock the take-up in its retracted set position as shown in Fig. 18. In order that the take-up hooks **292** may be accurately positioned to take the welt wire **404** from the supports **398** and to prevent the hooks and straps from subsequently moving upwardly with the narrowing machine, each of the bridges **274** is provided at its rear end with a curved plate **432** which overlies the idler pulley **272**, and engages against the arcuate base portion **294** of the hook **292**.

Some time prior to the time at which the welt wires **404** are to be operatively connected with the take-up hooks **292**, the picot bars **86** are turned downwardly to operative position. The narrowing machine is then given a dummy narrowing movement which causes the supporting brackets **398** to be moved downwardly so that the welt wires supported in these brackets engage with and depress the rearwardly extending trip arms **424** of the latch members **408**, causing the latch members to be turned to their alternative release position. The take-up straps **270** and hooks **292** now move forwardly under the influence of the take-up counterweight **298** into operative engagement with the welt wires **404**. As the narrowing machine is again moved to its high position, the welt wires held by the welt hooks **292** are stripped from the grooved portions **400** past the spring latches **402**. The take-up including the hooks **292** and welt wires **404**, can now move rearwardly under the influence of the take-up counterweight **298** to engage with and tension the welt portion of the fabric.

It will be understood that the dummy narrowing movement above referred to, is the usual motion of a narrowing machine which causes the picot points to take loops from the cooperating needles. For this dummy narrowing movement, the usual narrowing points are located in their inoperative positions beyond the ends of the needle series, and the picot shift mechanism is disconnected, so that the loops taken by the picot points are subsequently returned to the same needles from which they were taken. It will be further understood that the parts are constructed and arranged so that the second or relatively lower dipping movement of the narrowing machine frame moving in accordance with the usual narrowing motion, is employed to effect the transfer of the welt wires **404** from their supports into operative engagement with the welt hooks **292** as above described.

In accordance with one feature of the invention, welt wire magazines are provided for the several knitting sections for the storing of a number of welt wires, together with mechanism for transferring these welt wires as needed to the welt wire supports **398** to permit of continuous machine operation in the knitting of a succession of sets on the machine. As best shown in Figs. 7 and 8 of the drawings, the magazines comprise a series of brackets **436** which are rigidly secured to the narrowing machine rod support **70**, two such brackets being provided for each section at opposite ends thereof. The brackets take the shape of an inverted V, one arm of which is rigidly secured to the narrowing machine rod support **70**, and the other arm having formed on the face thereof, vertically extending ribs **438** and **440** between which the welt wires are supported at opposite ends. At the bottom of each rib **440** is provided a latch member **442** which is held yieldingly in position by a leaf spring **444** to retain the welt wires in the magazine. The brackets **436** also provide support for a rock shaft **446** which extends along the length of the narrowing frame, and has supported thereon depending lever arms **448** provided at their bottom ends with a wedge-shaped offset **450** which is arranged to engage above the bottom welt wire in the magazine to force the same downwardly past the latch **442** into the

welt wire support 398. For the raised inoperative position of the picot bars 86, the slotted portions 400 of the supports 398 are located directly beneath the bottom welt wire supported in the magazine. It will be noted also that the magazine brackets 436 are constructed and arranged to position the welt wires lengthwise of the needle series, so that the annular grooves in the welt wires will be in register with the welt wire supports. Two such actuating levers 448 are provided for each section located adjacent opposite ends of the welt wire magazine, and between the magazine brackets 436.

The position of the rock shaft 446 and the actuating levers 448 secured thereto, is controlled through mechanism which is actuated from the pattern chain of the machine to advance the levers 448 to force the bottom welt wire from the magazine into the slotted portions of the welt wire supports 398, and thereafter to cause the levers 448 to return to their normal inoperative position shown in Fig. 8. This mechanism comprises a downwardly extending actuating lever 451 secured to the rock shaft 446. The lever 451 is arranged to be engaged by the forward end of a link member 452 which is slidably supported at its forward end between the two arms of a forked bracket 460 on a pin 456 which extends through a slotted portion 458 of the link 452, and is journalled at opposite ends in the two arms of the bracket 460. The link plunger 452 is pivotally connected at its rear end to one arm of a bell-crank 462, the other arm of which is connected by a link 464 to a cam lever 466. A forwardly extending arm of the cam lever 466 carries an axially shiftable cam roller 468 which is arranged for engagement with an actuating cam 470 on the main cam shaft 38 of the machine. A tension spring 472 connected at one end to an upward extension of the forked lever 460, and at its other end to the actuating lever 451, tends to rock the shaft 446 and lever arms 448 in a clockwise direction to the inoperative position shown in Fig. 8, the action of this spring also acting to maintain the roller 460 in engagement with its cam 470. The mechanism through which the above connections are rendered operative to transfer a welt wire from each of the magazines into the support, comprises a shifter fork 474 (see Figs. 6 and 12) which at its rear end engages the sleeve hub of the cam roller 468, and at its forward end is secured to a pattern control rod 476. This rod is operatively connected at its left hand end to the upwardly extending arm of a pattern lever 478 supported on the pivot shaft 214, and arranged to be acted upon by appropriate buttons on the pattern chain 216 of the machine.

As best shown in Figs. 3 and 5 of the drawings, there is also provided means for easing the take-up tension exerted by the welt wire fabric take-up above described during narrowing or other conventional loop transferring operations, and also during the movement of the welt hooks in returning the initial course of welt fabric to the needles to close the welt. This mechanism as best shown in Figs. 3 and 5, comprises a ratchet 480 secured to the right hand end of the take-up shaft 284, and arranged to be engaged by the teeth of a ratchet pawl 482 pivotally mounted at 484 upon a cam lever 486, which is in turn pivotally supported at 487 on the machine frame. A small tension spring 488 connected at one end to the pawl 482, and at its other end to the cam lever 486 tends to maintain the pawl in engagement with the ratchet, this movement of the pawl being limited by the engagement of a tail on the pawl with a pin 490 on the cam lever 486. The rearwardly extending arm of the cam lever 486, carries an axially shiftable cam roller 492 which normally rides on a disk member 494 as shown in Fig. 3. A shifting of the main cam shaft 38 to the right to narrowing position, will act to position the roller 492 on a cam 496 which acts during the narrowing motion through the connections above described, to rock the take-up shaft 284 in a direction to ease the take-up tensioning strain of the take-up counterweight 298.

In accordance with the present invention, a mechanism is provided controlled from the pattern chain 216 of the machine, for rendering the connections above described operative to ease the take-up tension during the operation of closing the welt. These connections comprise a shifting fork 498 which is connected at one end to the sleeve hub of the cam roller 492, and at its other end is secured to a control rod 500 extending along the length of the machine. At its other end the control rod 500 is operatively connected to the upwardly extending arm of a pattern lever 502 pivotally supported on the pivot shaft 214 which is arranged to be actuated by appropriate buttons on the pattern chain 216. Actuation of the pattern lever 502 causes the control rod 500 to be shifted to the right to move the roller 492 into engagement with a cam 504 on the cam shaft 38 during the welt turning operation. The construction and arrangement of these parts including the cam roller 492 is such that the pawl 482 is rendered operative to rock the take-up shaft 284 to ease the take-up tension just prior to the time when the welt hooks are automatically moved rearwardly over the needles at the commencement of the welt transfer. Rocking movement imparted to the take-up shaft 284 is just sufficient so that the take-up tension is lightened without being entirely removed during the welt transfer operation as the welt hooks reach the limit of their rearward movement toward the press edge of the machine prior to the transfer. The fabric will be lightly tensioned by the action of the springs 296 in the take-up straps to insure proper control of the initial course of welt fabric loops, the tensioning strain exerted by the counterweight 298 will have been entirely eliminated. Inasmuch as the mode of operation of the welt hooks to effect the closing of the welt, has been fully described and illustrated in the copending application of Max C. Miller, Serial No. 726,285, filed May 18, 1934, and in the application of Karl Richard Lieberknecht, Serial No. 212,088, filed June 6, 1938, a detailed description of the operation of the welt mechanism herein is believed unnecessary. The continued racking of the pattern chain 216 will operate at the end of the welt transfer operation to remove the button from beneath the pattern lever 502, thus permitting the roller 492 to return to its normal inoperative position in engagement with the idler disk 494.

The operation of the several cooperating instrumentalities of the machine above described for the automatic pressing off of a completed set, and the starting of a new set on the machine without any necessity for stopping the machine, or for any particular attention on the part of the operator, will be briefly described as follows:—

Most of the several figures illustrate the machine in the position which will be taken immediately after the previous set has been pressed off

and dropped into the hoppers 307. For the purpose of this description of the operation of the machine, however, it will be assumed that the machine is in operation during the knitting of the last few courses of a set. Under these conditions the take-up counterweight 298 will have moved downwardly from the high position shown in Fig. 3, to a position only slightly above the pan 392. The reset counterweight 308 will occupy its high position shown in dot-and-dash lines in Fig. 3, being locked in this position by the latch 350. The reset clutch member 318 occupies its disengaged position to the right as shown in Fig. 22. The take-up hooks 292 will have been moved substantially to the limit of their downward movement adjacent the take-up sprocket rollers 282 as shown in Fig. 16.

As the active carriers 67 now make their last traversing stroke, an appropriate button on the pattern chain 216 acts upon the pattern lever 212, thus shifting the cam roller 206 into alignment with its actuating cam, so that during the next revolution of the cam shaft 38, a racking movement is imparted to the pattern shaft 168 which serves to bring the pattern shaft and pattern cams thereon into their press-off position in which all of the carriers are disconnected from their driving mechanism, and are left in idle position at the ends of the several knitting sections. It will be understood that any carrier stops which may have been in active operation to limit the length of carrier stroke will at this time have been automatically moved to inoperative position, thus permitting all of the carriers active during the knitting of the last course, to move to their extreme idling positions. On the next knitting cycle of the machine, the fabric is automatically pressed off, inasmuch as no new yarn is being fed to the needles.

As the fabrics being knitted on the several sections are freed from the needles by this pressing-off operation, they tend to snap forwardly under the influence of the fabric take-up. The welt wires 404 in the take-up hooks 292 tend to fall downwardly away from the hooks 292, thus pulling the fabrics off the table. The fabrics and welt hooks associated therewith fall into the hoppers 307 which, as previously described, are provided near the floor level to catch these fabrics. As the fabrics fall off the needles, the yarn or yarns of the last course still attached to the fabrics, will either unravel a few courses, or will be drawn through the carriers so that the pressed-off fabrics in the hoppers 307 will still be connected by such yarn or yarns with their associated carriers.

It will be understood that the last active carriers having the yarn still operatively connected to the pressed-off fabric, may now be employed for the knitting of the first or setting-up course of a new set. However, where it is desired to use a different set of carriers in setting up the new fabric, it will be understood that the connecting yarns leading from the idled carriers, will not interfere in any way with the setting up and continued knitting of the new fabric, so that the operator will have time during the knitting of the initial portions of a new set, to cut these connecting yarns and to manually bind them to the usual machine table clamps. Alternatively it is contemplated that the machine may be equipped with the automatic cutter and clamp mechanism shown in applicant's Patent No. 2,100,345, dated November 30, 1937. If this mechanism is employed, the yarn or yarns associated with the idled carriers will, during the succeeding press-off stroke, be automatically clamped and cut off.

During the cycle of machine operation in which the pressing off of the finished set takes place, or slightly before, an appropriate button on the chain 216 will rock the pattern lever 265 (see Fig. 6) to shift the slow-down switch 252 to slow position, thus automatically slowing the machine to a predetermined slow speed. The pattern lever and the slow-down switch associated therewith, will preferably be maintained in this slow speed position during a number of consecutive revolutions of the main cam shaft, a series of appropriate buttons on the pattern chain 216 being provided for this purpose.

As the fabrics comprising the completed set are pressed off, the take-up counterweight 298 is permitted to fall against the pan 392, and acts through intervening connections to shift the clutch 316 to the left from the position shown in Fig. 22, into its engaged reset position. As the clutch meshes, the latch 350 is moved away from the stop ratchet 354, so that the reset drum 316 and counterweight 308 are rendered operative to rotate the take-up shaft 284 in a reverse direction. As previously pointed out, the downward movement of the relatively heavy counterweight 308 is regulated by the operation of the friction brake 324. It will be noted particularly that the operation of the resetting mechanism is such as to automatically reset the entire take-up mechanism including the straps 270 and the take-up counterweight 298. As the take-up mechanism approaches its fully reset position, the counterweight 298 engaging against the offset upper end of the link 394, operates through the connections previously described, to again shift the clutch 318 to its disengaged position, and to re-engage the latch 350 with the stop ratchet 354. The latch mechanism comprising the latches 408 is now rendered operative to lock the take-up in its reset position. As previously pointed out, the rearward movement of the cross bar 426 beneath the cover plates 428, shifts the latch towards its latching position. The mechanism including particularly the stop surfaces 430 engageable with the cross bars 426 is so arranged that the take-up straps 270, hooks 292 and cross bar 426 are permitted to move beyond the normal latch position, so that the latch arms 426 over-ride the notches 420. As the reset clutch 318 is now disengaged, the subsequent forward movement of these parts under the influence of the regular take-up counterweight 298, causes the latch arm 416 to be forced into the notches 420 under the influence of the spring-pressed plungers 442. During subsequent operation of the machine, an appropriate button on the pattern chain 216 is arranged to act upon the pattern lever 348 which through control link 346 and shifter fork 344 operates to shift the cam roller 338 into alignment with its actuating cam to start reciprocation of the pawl 332 to rewind the reset drum 316 and reset counterweight 308. It will be understood that the rewind racking mechanism is maintained in operation during a sufficient length of time to return the reset counterweight 308 to the high position shown in dot-and-dash lines in Fig. 3, a row of buttons on the pattern chain 216 being provided for this purpose.

Subsequent to the press-off operation, the pattern control from the pattern chain 216 is again rendered operative through the engagement of an appropriate button with the pattern lever 212

to rack the pattern shaft 168 and to cause selected carriers to be rendered operative to feed yarn for the first or setting-up course of the next fabric or stocking. In the illustrated embodiment of the invention, this course will be the initial course of the next stocking welt.

At the same time that the carriers are again rendered operative, the half revolution clutch associated with the welt mechanism of the machine is caused to be thrown into operation moving the welt hooks 90 into operative position to take selected needle wale loops from the needles for the setting-up of the initial welt course of the new fabric. Inasmuch as the construction and mode of operation of this welt mechanism together with the pattern controls for actuating the same, have been fully described and illustrated in the copending Lieberknecht application Serial No. 212,088, it is believed sufficient to state that pattern connections operated from the pattern chain 216 acting through the pattern link 151, shifts the latch 145 from behind the clutch actuating lever arm 147 to shift the clutch into operative position (see Fig. 2).

During continued operation of the machine, the welt fabric is knitted in the usual manner, the pendants 92 acting through the take-up spring 102 to take up the fabric as knitted. Subsequent to the setting up of the new fabric, the last button rides out from under the pattern lever 265, causing the slow speed switch to be returned to its high speed position. After a few courses of welt fabric have been knitted, the picot bars are turned down from their dot-and-dash position shown in Fig. 12, to the solid line position therein shown, it being understood that a welt bar 404 has been previously placed in the supports 398 through the operation of the magazine transfer mechanism above described. Prior to the operation of closing the welt, and while the welt hooks 90 are still actively in operation taking up the fabric, the cam shaft is shifted to its narrowing position, and the narrowing machine goes through a dummy motion. At this time the racking mechanism for the picot bar is disconnected, and the usual narrowing fingers are positioned in inoperative position beyond the ends of the needle series. The second or lower dipping movement comprised by the narrowing machine motion, acts as above described, to move the welt wire supports 398 and welt wires 404 supported therein, downwardly until the welt wires are brought into contact with the rearwardly extending trip arms 424 of the latch levers 408, so that the latches are moved to their disengaged position, and the welt hooks 292 are permitted to move forwardly into active engagement with the welt wires 404. At this time further forward movement of the take-up mechanism is prevented, through the engagement of the welt wires 404 in their slotted portions 406 of their supports 398. As the narrowing machine again rises to its inoperative position, the welt hooks 292 held down as above described, by the engagement of the cover plates 432 therewith, strip the welt wires from their supports. The welt wire take-up straps now act under the influence of the take-up counterweight 298 to move the welt wires 404 forwardly into engagement with the welt fabric.

When sufficient welt fabric has been knitted, the welt pendants 92 are again rendered operative by the engagement of the pattern controlled half revolution clutch 138 to close the welt. Inasmuch as this operation has been fully described and illustrated in the copending application of Lieberknecht, above referred to, it is believed sufficient to state that the welt hooks 90 are now moved rearwardly over the needles, and then down to replace the initial course of fabric loops back of the needles. During this welt closing operation, and just prior to the course in which the pendants move towards the needles, an appropriate button rides under the pattern lever 502 to shift the control rod 500 to the right, thus aligning the roller 492 with its cam 504 to relieve the fabric take-up tension. At the end of this welt closing operation, the roller 492 is permitted to again return to its normal inoperative position in engagement with the idler disk 494.

When the picot bar is no longer required in its downward operative, that is subsequent to the knitting of the usual picot course, and prior to the welt transfer, it is again shifted to the high inoperative position shown in dot-and-dash lines in Fig. 12. Subsequently, an appropriate button on the pattern chain 216 is arranged to actuate the pattern chain lever and control rod 476 to bring the cam roller 468 into alignment with its cam 470, thus causing the welt wire transfer mechanism to be rendered operative to transfer the bottom welt wire from each magazine to the welt wire supports 398. Just prior to the welt closing operation, the slow-down switch 252 is again shifted to its slow position through the engagement of an appropriate button with the pattern lever 212 to cause the machine to be driven at the slower rate during this operation. At or immediately following the completion of the welt closing operation, the pattern lever and slow speed switch associated therewith, are again shifted to their high speed positions.

Subsequent to the closing of the welt, the welt mechanism comprising the welt hooks 90, pendants 92 and the cam lever system associated therewith, are preferably moved to the high inoperative position shown in dot-and-dash lines in Fig. 2. It is contemplated that this movement of the welt mechanism may be performed manually or through the agency of automatic mechanism such as that more fully set forth in the copending application of Lieberknecht above referred to. It is assumed also that the pendants will be again moved downwardly either manually or through the agency of such automatic mechanism prior to the next setting-up operation.

It will be understood that the invention is not limited to the specific embodiment shown, and that various deviations may be made therefrom without departing from the spirit and scope of the appended claims.

What is claimed is:

1. In a flat full-fashioned hosiery machine having knitting devices including a needle series and welt devices for knitting welted fabrics, the combination with a welt wire, of a fabric take-up arranged to be operatively engaged with the welt wire to take up the fabric, means to cause the completed fabric to be pressed off from the needles, and means acting thereupon to impart relative movement to the take-up and welt wire to disconnect the completed fabric from the take-up and thereby to discharge the completed fabric from the machine.

2. In a flat full-fashioned hosiery machine having knitting devices including a needle series and welt devices for knitting welted fabrics, the combination with a welt wire, of a fabric take-up

arranged to be operatively engaged with the welt wire to take up the fabric, means to cause the completed fabric to be pressed off from the needles, means acting thereupon to impart relative movement to the take-up and welt wire to disconnect the completed fabric from the take-up and thereby to discharge the completed fabric from the machine, and a hopper to receive the discharged fabric.

3. In a flat full-fashioned hosiery machine having knitting devices including a needle series and welt devices arranged for mechanically turning the welt, the combination with a welt wire, of a fabric take-up constructed and arranged for engagement with the welt wire to take up the fabric, and subsequently to discharge the fabric and associated welt wire from the take-up, means to cause the completed fabric to be pressed off from the needles, means acting thereupon to impart relative movement to the take-up and welt wire to disconnect the completed fabric from the take-up and thereby to discharge the completed fabric from the machine, and a hopper arranged to receive the pressed-off fabric and welt wire discharged from the take-up.

4. In a flat full-fashioned hosiery machine having knitting devices including a needle series, and welt devices for knitting and for pressing off welted fabrics, a take-up device comprising a welt wire, a pair of straps, welt wire engaging hooks on the straps, tensioning means for exerting a take-up tension on the straps, supporting means for said straps arranged for moving the welt wire and fabric supported thereby continuously away from the needles during the knitting of a fabric, means to cause the completed fabric to be pressed off from the needles, said hooks being constructed and arranged upon pressing off of the fabric to disconnect the completed fabric from the take-up and thereby to discharge the fabric and welt wire from the machine.

5. In a flat full-fashioned hosiery machine having knitting devices adapted for knitting and for pressing off welted fabrics, the combination with a welt wire, of a welt wire take-up device including means operative upon pressing off of a completed blank to discharge the welt wire and attached fabric from the take-up.

6. In a flat full-fashioned knitting machine having knitting and welt devices for knitting and for pressing off welted fabrics, a take-up device comprising with a welt wire, a pair of straps, and supporting means for said straps arranged for moving the welt wire and fabric supported thereby in substantially linear directions during the knitting of a fabric, and connecting means between the welt wire and straps arranged upon pressing off of the fabric to discharge the fabric and welt wire from the machine.

7. In a flat full-fashioned hosiery knitting machine provided with means for automatically performing the several operations essential for pressing off a completed hosiery blank and for starting the knitting of a new blank, in a continuous cycle, said means comprising knitting devices including knitting needles, a fabric take-up arranged to draw off the fabric as knitted and upon pressing off of the completed fabric to discharge the fabric from the take-up, means to cause the completed blank to be automatically pressed off from the needles and thereby to discharge the fabric from the take-up, yarn carriers, and means for rendering a selected yarn carrier active to feed an initial course of yarn to the needles to start the knitting of a new blank.

8. In a flat full-fashioned knitting machine provided with means for automatically performing the several operations essential for pressing off a completed hosiery blank and for starting the knitting of a new blank, in a continuous cycle, said means comprising knitting devices including knitting needles, means to cause the completed blank to be automatically pressed off from the needles, a welt wire support, a fabric take-up device comprising with a welt wire, a fabric take-up attachable to the welt wire and arranged upon pressing off the completed blank to discharge the completed blank and associated welt wire from the take-up, means for rendering a selected yarn carrier active to feed an initial course of yarn to the needles to start the knitting of a new blank, a welt mechanism arranged for mechanically setting up and for closing the welt portion of the fabric, and means for relatively moving the take-up and welt wire support to operatively connect the take-up with a welt wire from the support to take up the welt portion of the new blank.

9. In a flat full-fashioned hosiery knitting machine provided with means for automatically performing the several operations essential for discharging from the machine a completed hosiery blank and for starting the knitting of a new blank, in a continuous cycle, said means comprising knitting needles, yarn carriers, means for automatically throwing selected carriers into and out of operation operable to cause the completed blank to be pressed off and to feed yarn for the initial course of a new blank, and means for mechanically setting up and turning the welt, a welt wire support, a fabric take-up mechanism comprising with a welt wire, a fabric take-up attachable to the welt wire and arranged for drawing off the fabric as knitted, means for resetting the fabric take-up, and means for operatively connecting a welt wire from the support with the take-up to take up the welted portion of the new blank.

10. In a flat full-fashioned hosiery knitting machine provided with means for automatically performing the several operations essential for discharging from the machine a completed hosiery blank and for starting the knitting of a new blank, in a continuous cycle, said means comprising knitting needles, yarn carriers, means for automatically throwing selected carriers into and out of operation operable to cause the completed blank to be pressed off and to feed yarn for the initial course of a new blank, and means for mechanically setting up and turning the welt, a welt wire support, a fabric take-up mechanism comprising with a welt wire, a fabric take-up attachable to the welt wire and arranged for drawing off the entire length of the fabric as knitted in linear directions, means for resetting the fabric take-up, and means for operatively connecting a welt wire from the support with the take-up to take up the welted portion of the new blank.

11. In a flat full-fashioned hosiery knitting machine provided with means for automatically performing the several operations essential for discharging from the machine a completed hosiery blank and for starting the knitting of a new blank, in a continuous cycle, said means comprising knitting needles, yarn carriers, means for automatically throwing selected carriers into and out of operation operable to cause the completed blank to be pressed off and to feed yarn for the initial course of a new blank, and means

for mechanically setting up and turning the welt, a welt wire, a welt wire magazine, a welt wire support, means for transferring a welt wire from the magazine to the support, a fabric take-up attachable to the welt wire and arranged for drawing off the entire length of the fabric as knitted in linear directions, means for resetting the fabric take-up, and means for operatively connecting a welt wire from the support with the take-up to take up the welted portion of the new blank.

12. In a flat knitting machine, knitting instrumentalities including a needle series, a plurality of yarn carriers traversable to feed yarn, selecting means for rendering selected carriers operative and inoperative to feed yarn, a fabric take-up arranged to draw off the fabric as knitted and upon the pressing off of the completed fabric to discharge the fabric from the take-up, and control means operative during continued operation of said knitting instrumentalities to render active carriers inoperative to cause a finished fabric to be pressed off and to discharge the fabric from the take-up, and thereafter to render a selected carrier operative to form a new set on the machine.

13. In a flat knitting machine, knitting instrumentalities including a needle series, a plurality of yarn carriers traversable to feed yarn, selecting means for rendering selected carriers operative and inoperative to feed yarn, a fabric take-up arranged to draw off the fabric as knitted and upon pressing off of the completed fabric to discharge the fabric from the take-up, control means operative during continued operation of said knitting instrumentalities to render active carriers inoperative to cause a finished fabric to be pressed off and to be discharged from the take-up, and thereafter to render a selected carrier operative to form a new set on the machine, and control means operative to slow the operation of said knitting instrumentalities during said press-off.

14. In a flat knitting machine, knitting instrumentalities including a needle series, a plurality of yarn carriers traversable to feed yarn, selecting means for rendering selected carriers operative and inoperative to feed yarn, a fabric take-up arranged to draw off the fabric as knitted and upon the pressing off of the completed fabric to discharge the fabric from the take-up, control means operative during continued operation of said knitting instrumentalities to render active carriers inoperative to cause a finished fabric to be pressed off and to be discharged from the take-up, and thereafter to render a selected carrier operative to form a new set on the machine, and control means operative to slow the operation of said knitting instrumentalities during said press-off and subsequent setting-up operations.

15. In a flat knitting machine having knitting devices including a needle series, a plurality of yarn carriers traversable to feed yarn, traversing means for said carriers, control means for operatively connecting and disconnecting selected carriers from said traversing means, a fabric take-up arranged to draw off the fabric as knitted and upon the pressing-off of the completed fabric to discharge the fabric from the take-up, and pattern means for controlling the operation of the machine to press off a completed fabric to discharge the completed fabric from the take-up, and to set up a new fabric during continued machine operation which comprises means to disconnect all active carriers from said traversing means during a full reciprocation thereof to cause the finished fabric to be pressed off and to be discharged from the take-up.

16. In a flat knitting machine having knitting devices actuated therefrom including a needle series, a plurality of yarn carriers traversable to feed yarn, traversing means for said carriers, control means for operatively connecting and disconnecting selected carriers from said traversing means, a fabric take-up arranged to draw off the fabric as knitted and upon the pressing off of the completed fabric to discharge the fabric from the take-up and pattern means for controlling the operation of the machine to press off a completed fabric to discharge the completed fabric from the take-up, and to set up a new fabric during continued machine operation which comprises means to disconnect all active carriers from said traversing means during a full reciprocation thereof to cause the finished fabric to be pressed off and to be discharged from the take-up, and thereafter to operatively connect a selected carrier to form a new set on the machine.

17. In a flat full-fashioned knitting machine, knitting devices including a needle series, mechanically operating means to set up and to turn a welt, a plurality of yarn carriers traversable to feed yarn, traversing means for said carriers, control means for operatively connecting and disconnecting selected carriers from said traversing means, a fabric take-up, arranged to draw off the fabric as knitted and upon the pressing off of the completed fabric to discharge the fabric from the take-up and pattern means for controlling the operation of the machine to cast off a completed fabric and to set up and to close the welt during continued machine operation which comprises means to disconnect all active carriers from said traversing means during a full reciprocation thereof to cause the finished fabric to be pressed off and to be discharged from the take-up, to connect a selected carrier for feeding an initial course of yarn to the needles, and for actuating said welt mechanism to set up and to close the welt.

18. In a flat full-fashioned knitting machine, knitting devices including a needle series, mechanically operating means to set up and to turn a welt, a plurality of yarn carriers traversable to feed yarn, traversing means for said carriers, control means for operatively connecting and disconnecting selected carriers from said traversing means, a fabric take-up, and pattern means for controlling the operation of the machine to cast off a completed fabric and to set up and to close the welt during continued machine operation which comprises means to disconnect all active carriers from said traversing means during a full reciprocation thereof to cause the finished fabric to be pressed off, to connect a selected carrier for feeding an initial course of yarn to the needles, and to cause said welt mechanism to set up and close the welt, and means for slowing the operation of the machine during each of said press-off, setting-up and welt closing operations.

19. In a flat full-fashioned knitting machine, knitting devices including a needle series, a yarn carrier, traversing means for the carrier, control means for operatively connecting and disconnecting the carrier, a fabric take-up device arranged to draw off the fabric as knitted and upon the pressing off of the completed fabric to discharge the fabric from the take-up, means to arrest the take-up action of the fabric take-up, and control means operative upon completion of

a knitted fabric to disconnect the carrier to cause the fabric to be pressed off and to arrest the take-up action of the fabric take-up in order to discharge the completed fabric from the take-up.

20. In a flat full-fashioned knitting machine, knitting devices including a needle series, a yarn carrier, traversing means for the carrier, control means for operatively connecting and disconnecting the carrier, a take-up device comprising with a welt wire, a strap take-up, supporting and tensioning means for the strap take-up including an idler roller at the front of the machine, and additional idler supports for the strap take-up located below said idler roller, the length of take-up provided for said straps between the needles and said additional idler supports being greater than the length of fabric to be knitted thereby, control means arranged upon completion of a knitted fabric to disconnect the carrier to cause the fabric to be pressed off, and connecting means between the welt wire and strap take-up arranged upon pressing off of the fabric to discharge the fabric and welt wire from the machine.

21. In a flat full-fashioned knitting machine, knitting devices including a needle series, a yarn carrier, traversing means for the carrier, control means for operatively connecting and disconnecting the carrier, a take-up device comprising with a welt wire, a strap take-up, supporting and tensioning means for the strap take-up including an idler roller at the front of the machine, and additional idler supports for the strap take-up located below said idler roller, the length of take-up provided for said straps between the needles and said additional idler supports being greater than the length of fabric to be knitted thereby, control means arranged upon completion of a knitted fabric to disconnect the carrier to cause the fabric to be pressed off and to arrest the take-up action of said strap take-up, and connecting means between the welt wire and strap take-up arranged upon pressing off of the fabric to discharge the fabric and welt wire from the machine.

22. In a flat full-fashioned hosiery machine having knitting devices arranged for knitting welted fabrics, the combination with a welt wire, of a fabric take-up device attachable to the welt wire constructed and arranged to draw off the entire length of the knitted hosiery blank in take-up directions extending continuously away from the knitting devices, said take-up device including hooks arranged upon casting off of the finished blank to release the welt wire and fabric supported thereon from the take-up and thereby to discharge the fabric from the machine.

23. In a flat knitting machine having needles and cooperating knitting instrumentalities, a fabric take-up device which comprises with a welt wire, a pair of take-up straps, welt wire engaging hooks, and take-up springs arranged to provide resilient sections in said straps, supporting means for said straps including a fabric take-up idler roller at the front of the machine, driving rollers for said straps spaced from the knitting devices a greater distance than the length of the fabric to be knitted, and tensioning means acting on said latter rollers.

24. In a flat knitting machine having needles and cooperating knitting instrumentalities, a fabric take-up device which comprises with a welt wire, a pair of endless straps, welt wire engaging hooks, and take-up springs arranged to provide resilient sections in said straps, supporting means for said straps including a fabric take-up idler roller at the front of the machine, driving rollers for said straps spaced from the knitting devices a greater distance than the length of the fabric to be knitted, take-up tensioning means arranged to act on said latter rollers, means for rotating said rollers in a reverse direction to reset the take-up, and clutching means shiftable to connect said take-up rollers with said resetting means.

25. In a flat knitting machine having knitting devices including a needle series and welt devices for knitting welted fabric, a fabric take-up device which comprises with a welt wire, a pair of endless straps, welt wire engaging hooks on the straps, supporting means for said straps including sprocket rollers adjacent the needle series, a fabric take-up roller at the front of the machine, driving sprocket rollers for said straps spaced from the knitting devices a greater distance than the length of the fabric to be knitted, tensioning means acting o nsaid driving sprocket rollers, means for rotating said rollers in a reverse direction to reset the take-up, and a latching device acting upon said first-mentioned sprocket rollers for latching the take-up in said reset position.

26. In a flat full-fashioned hosiery machine having knitting and welt devices for knitting welted fabrics, the combination with a welt wire, of take-up straps connectible to the welt wire, and supporting and tensioning means for the take-up straps including an idler roller at the front of the machine, and additional roller supports for the straps located below said idler roller, the length of take-up provided for said straps between the knitting devices and said latter take-up members being greater than the length of the fabric to be knitted thereby.

27. In a flat full-fashioned hosiery machine having knitting and welt devices for knitting welted fabrics, the combination with a welt wire, of a strap take-up connectible to the welt wire, supporting and guiding means for said strap take-up and fabric attached thereto on which said take-up including the welt wire and attached fabric are movable in take-up directions extending continuously away from the knitting devices through a distance greater than the length of the fabric to be knitted thereby, and tensioning means acting on said strap take-up at a point on the machine removed from the knitting devices in said take-up directions a distance greater than the length of fabric to be knitted.

28. In a flat knitting machine, a fabric take-up mechanism which comprises with a welt wire, a strap take-up connectible to said welt wire, tensioning means acting on said strap take-up to take up the fabric, resetting means arranged to draw said strap take-up rearwardly into position for engagement with the welt wire, and clutching means shiftable to connect said resetting means to reset the strap take-up.

29. In a flat knitting machine, fabric take-up mechanism which comprises with a welt wire, a strap take-up connectible to said welt wire, tensioning means acting on the strap take-up to take up the fabric, resetting means arranged to draw said strap take-up rearwardly into position for engagement with the welt wire, and means rendered operative by continued movement of the take-up in the take-up direction to throw said resetting means into operation.

30. In a flat knitting machine, fabric take-up mechanism which comprises with a welt wire, a strap take-up connectible to said welt wire, ten-

sioning means acting on the strap take-up to take up the fabric, resetting means arranged to draw said strap take-up rearwardly into position for engagement with the welt wire, clutching means shiftable to connect and to disconnect said resetting means to reset the strap take-up, means rendered operative by continued movement of the take-up in the take-up direction to engage the clutch, and means rendered operative by the return of the take-up to reset position to disengage the clutch.

31. In a flat knitting machine having knitting devices and a cam shaft, the combination of a fabric take-up device which comprises with a welt wire, a strap take-up connectible with the welt wire, tensioning means including a take-up counterweight for exerting a take-up tension on the strap take-up, resetting means including a resetting counterweight arranged to reset the strap take-up including said take-up counterweight for engagement with a welt wire, and means for connecting said resetting counterweight to reset said strap take-up.

32. In a flat knitting machine having knitting devices and a cam shaft, the combination of a fabric take-up device which comprises with a welt wire, a strap take-up connectible with the welt wire, tensioning means including a take-up counterweight for exerting a take-up tension on the strap take-up, resetting means including a resetting counterweight arranged to reset the strap take-up including said take-up counterweight for engagement with a welt wire, means for connecting said resetting counterweight to reset said strap take-up, and means for re-positioning the resetting counterweight.

33. In a flat knitting machine having knitting devices and a cam shaft, the combination of a fabric take-up device which comprises with a welt wire, a strap take-up connectible with the welt wire, tensioning means including a counterweight for exerting a take-up tension on the strap take-up, resetting means including a counterweight arranged to reset the strap take-up and associated tensioning counterweight for engagement with a welt wire, means for operatively connecting said resetting counterweight to reset said strap take-up, and connections from the cam shaft for re-positioning said resetting counterweight.

34. In a flat knitting machine having knitting devices and a cam shaft, the combination of a fabric take-up device which comprises with a welt wire, a strap take-up connectible with the welt wire, tensioning means including a counterweight for exerting a take-up tension on the strap take-up, resetting means including a counterweight arranged to reset the strap take-up for engagement with the welt wire, means shiftable to operatively connect said resetting counterweight to said strap take-up, connections from the cam shaft for re-positioning said resetting counterweight, and means for controlling the operation of each of said shifting means and said counterweight re-positioning means.

35. In a flat knitting machine having knitting devices, a fabric take-up mechanism which comprises with a welt wire, a strap take-up connectible to the welt wire, tensioning means for said strap take-up arranged for moving said strap take-up gradually away from the knitting devices, resetting means for returning the strap take-up rearwardly into position for engagement with a welt wire, means for resetting the tensioning means to tension the strap take-up in its reset position, and means for throwing said resetting and retensioning means into operation.

36. In a flat knitting machine arranged for knitting welted fabrics, a fabric take-up mechanism which comprises with a welt wire, a strap take-up comprising a pair of take-up straps having welt wire engaging hooks connectible with the welt wire and arranged to draw off the fabric in a take-up direction, a welt wire support on the machine, resetting means for drawing the strap take-up in a return direction into position for engagement with the welt wire, means for imparting relative positioning movements to the take-up and support to operatively connect the take-up straps including said hooks in the reset position with a welt wire on the support, and means for rendering the take-up device operative to take up a fold of welt fabric.

37. In a flat knitting machine arranged for knitting welted fabrics, a fabric take-up device which comprises with a welt wire, a fabric take-up attachable to the welt wire and arranged to draw off the fabric in a take-up direction, a welt wire support on the machine, means for returning the take-up into position for engagement with the welt wire, means for operatively connecting a welt wire from the support with the take-up in its reset position, means for rendering the take-up device operative to take up a fold of welt fabric, and pattern means for controlling the operation of each of said means to reset the take-up, to connect a welt wire therewith, and to take up a fold of welt fabric.

38. In a multiple section flat knitting machine arranged for knitting welted fabrics, fabric take-up devices associated with the several knitting sections which comprise for each knitting section a welt wire, a fabric take-up attachable to the welt wire and arranged to draw off the fabric in a take-up direction, a welt wire support associated with each knitting section, resetting means for returning said take-ups simultaneously into position for engagement with the welt wires, means for simultaneously relatively moving said supports and take-ups to operatively connect the welt wires with the take-ups, and pattern means for controlling the operation of said means to reset the fabric take-ups and to operatively connect the welt wires therewith.

39. In a flat knitting machine having knitting devices, a fabric take-up device which comprises with a welt wire, a pair of take-up straps, roller supports for the straps adjacent the knitting devices, welt wire engaging hooks, tensioning means including strap engaging rollers acting on said straps to impart a take-up action thereto, positioning means for moving said take-up device in a reverse direction to reset said device including the hooks in position for engagement with the welt wire, a welt wire support, and means for positioning said support to cause the welt wire to be taken from the support by the hooks, a latch connectible to lock the take-up device including the hooks in reset position, means rendered operative by the reverse movement of the take-up device to move the latch to latching position, and means for tripping the latch to throw the take-up device into active operation.

40. In a flat knitting machine having knitting and welt devices arranged for mechanically turning the welt, a narrowing machine frame, a welt wire support supported to move with said frame, a take-up device including with a welt wire, a pair of take-up straps, roller supports for the straps adjacent the knitting devices, welt wire

engaging hooks on the straps, tensioning means including strap engaging rollers for imparting a take-up action to said straps, positioning means for moving the take-up device in a reverse direction to reset the hooks in position for engagement with a welt wire, a latch connectible to lock the take-up device including the hooks in reset position, means rendered operative by the reverse movement of the take-up device to move the latch to latching position, and means for operatively connecting the welt wire with the take-up including means for imparting a dipping movement to the narrowing frame, and means rendered operative by said dipping movement to trip the latch to cause the welt hooks to strip the welt wire from its support.

41. In a flat full-fashioned knitting machine arranged for mechanically turning the welt, the combination with a welt wire, of a welt wire support, a fabric take-up comprising a pair of endless straps attachable to the welt wire, tensioning means continuously connected to the straps, take-up resetting means for moving the fabric take-up rearwardly into position for engagement with a welt wire from said support, means acting thereafter to disconnect the resetting means, a latch device having alternative latching and release positions to lock the fabric take-up in reset position, means actuated by rearward movement of the take-up to set the latch in latching position whereby the take-up is retained in its reset position when the resetting means is disconnected therefrom, and means for moving the support to position a welt wire for engagement with the take-up and to trip said latching device.

42. In a flat knitting machine arranged for mechanically turning the welt, a fabric take-up mechanism which comprises with a welt wire, a strap take-up connectible to said welt wire, tensioning means acting on said strap take-up to take up the fabric, resetting means arranged to draw said strap take-up rearwardly into position for engagement with a welt wire, a latching device for locking the strap take-up in its reset position, and a welt wire support movable to position a welt wire carried on the support for engagement by the fabric take-up, said latching device comprising a pair of latch members, means for supporting said latch members alternatively in latching or release position, trip elements engageable with the strap take-up to shift the latch members to latching position, and additional trip members engageable with the welt wire when moved to take-up engaging position to shift the latch members to their release position.

43. In a flat knitting machine arranged for mechanically turning the welt, a fabric take-up device which comprises with a welt wire, a strap take-up connectible with the welt wire, tensioning means including a counterweight for exerting a take-up tension on the strap take-up, resetting means arranged to reset the strap take-up including said counterweight in position for engagement with the welt wire, and a latching device for supporting the strap take-up in said reset position comprising latch members, trip elements forming part of said latch members, an actuating element on said strap take-up engageable with said trip element to shift the latch to locking position, and a guide member engageable with said actuating element to cause the trip element to trip the latch.

44. In a flat knitting machine arranged for mechanically turning the welt, a narrowing machine frame, a welt wire support supported to move said frame, a take-up device including with a welt wire, a pair of take-up straps, welt wire engaging hooks on the straps, tensioning means for imparting a take-up action to said straps, positioning means for moving the take-up device in a reverse direction to reset the hooks in position for engagement with the welt wire, a latching device comprising latch members connectible to lock said straps and hooks in reset position, means rendered operative by the reverse movement of the take-up device to move the latch to latching position, guide elements engageable with said hooks in welt wire engaging position, and means for operatively connecting the welt wire with the take-up including means for imparting a dummy movement to the narrowing frame, and means rendered operative by said dummy movement to trip the latch to cause the welt hooks to engage with the welt wire and by the subsequent upward movement of the narrowing frame to strip the welt wire from its support.

45. In a flat knitting machine arranged for mechanically turning the welt, a narrowing machine frame, a welt wire support supported to move said frame, a take-up device including with a welt wire, a pair of take-up straps, welt wire engaging hooks on the straps, tensioning means for imparting a take-up action to said straps, resetting means for moving the take-up device in a reverse direction to reset the hooks in position for engagement with the welt wire, a latch connectible to lock said straps and hooks in reset position, means rendered operative by the reverse movement of the take-up device to move the latch to latching position comprising a cross bar connected to said straps, a trip element forming part of the latch, a guide member engageable with the cross member for positioning said cross member to trip the latch, and means for operatively connecting the welt wire with the take-up including means for imparting a dummy movement to the narrowing frame, and means rendered operative by said dummy movement to trip the latch to cause the welt hooks to engage with and strip the welt wire from its support.

46. In a flat knitting machine arranged for knitting welted fabric, a fabric take-up device including a welt wire, and take-up means connectible thereto, a welt wire magazine on the machine, means for positioning the take-up means to receive and to tension a welt wire against the fabric, and means for removing the welt wire from the magazine and for operatively connecting said welt wire with the fabric take-up.

47. In a flat full-fashioned knitting machine having knitting devices and a narrowing frame associated therewith, a welt wire magazine, and supporting means for said magazine on the narrowing frame.

48. In a flat full-fashioned knitting machine arranged for knitting welted fabric, a fabric take-up device including a welt wire and take-up means connectible thereto, a welt wire magazine on the machine, a welt wire support and means associated therewith for transferring a welt wire from the magazine to the support, and means for relatively moving the support and take-up means to operatively connect the welt wire with the take-up means.

49. In a flat full-fashioned knitting machine arranged for knitting welted fabric, a fabric take-up device, including a welt wire and take-up means connectible thereto, a welt wire magazine on the machine, a welt wire support and means associated therewith for transferring a welt wire

from the magazine to the support, and means for relatively moving the support and take-up means to operatively connect the welt wire with the take-up means, each of said magazine and support having means for controlling the lengthwise position of the welt wire.

50. In a flat full-fashioned knitting machine arranged for knitting welted fabrics, a fabric take-up device including a welt wire having formed therein annular grooved portions, and take-up means connectible to the welt wire, a welt wire magazine on the machine comprising slotted holders engageable with said annular grooves, a welt wire support comprising slotted supporting elements engageable with said annular grooves and arranged to receive a welt wire from the magazine, means for transferring a welt wire from the magazine to the support, and means for relatively moving the support and take-up means to operatively connect the welt wire with the take-up means.

51. In a flat full-fashioned knitting machine arranged for mechanically turning the welt, a fabric take-up device including a welt wire and take-up means connectible therewith, a welt wire support slotted to receive a welt wire, means for yieldably holding a welt wire in the support, means for relatively moving the take-up means and the support to operatively connect a welt wire carried on the support with the take-up means, a welt wire magazine comprising holders slotted to receive a plurality of welt wires in stacked position, means for yieldably supporting the welt wires in the magazine, a transfer element, and means for actuating the transfer element to force the outermost of said stacked welt wires from the magazine into the support.

52. In a flat full-fashioned knitting machine arranged for mechanically turning the welt, a fabric take-up device including a welt wire and take-up means connectible thereto, a welt wire support, means for relatively moving the take-up means and the support to operatively connect a welt wire carried on the support with the take-up means, a welt wire magazine comprising slotted holders to receive a plurality of welt wires in stacked position, means for yieldably supporting the welt wires in the magazine, a wedge-shaped transfer element engageable between the outermost and adjacent welt wires in the magazine, and means for actuating said transfer element to force a welt wire from the magazine into said support.

53. In a flat full-fashioned knitting machine arranged for mechanically turning the welt, a fabric take-up device including a welt wire, and take-up means connectible therewith, a welt wire magazine on the machine, and means for removing a welt wire from the magazine and for operatively connecting said welt wire with the take-up means.

54. In a flat full-fashioned knitting machine arranged for mechanically turning the welt, a narrowing machine frame, a picot bar on the narrowing frame, a fabric take-up device including a welt wire and take-up means connectible to the welt wire, means for supporting a welt wire on the picot bar, a welt wire magazine supported on the narrowing frame, means for transferring a welt wire from the magazine to said supporting means, means for positioning the take-up means for engagement with the welt wire, and means for operatively connecting said welt wire with the take-up including means for imparting a dipping movement to the narrowing frame.

55. In a flat full-fashioned knitting machine arranged for mechanically turning a welt, a narrowing machine frame, a picot bar on the narrowing frame movable between raised inoperative and downward operative positions, a fabric take-up device including a welt wire and take-up means connectible to the welt wire, a welt wire support on the picot bar arranged for the raised inoperative position of the picot bar to receive a welt wire, and for the operative position thereof to support the welt wire for connection with the take-up means, a welt wire magazine supported on the narrowing frame, and means for transferring a welt wire from the magazine to said welt wire support.

56. In a flat full-fashioned knitting machine arranged for mechanically turning the welt, a narrowing machine frame, a picot bar on the narrowing frame shiftable between inoperative raised and downward operative positions, a fabric take-up device including a welt wire and take-up means connectible to the welt wire, a welt wire support on the picot bar arranged for the raised inoperative position of the picot bar to receive a welt wire, and for the operative position thereof to support the welt wire for connection with the take-up means, a welt wire magazine supported on the narrowing frame, means for transferring the welt wire from the magazine to said welt wire support, means for positioning the take-up means for engagement with the welt wire, means for operatively connecting said welt wire with the take-up including means for imparting a dipping movement to the narrowing frame, and means operative during said dipping movement to strip the welt wire from its support.

57. In a flat full-fashioned knitting machine arranged for mechanically turning a welt, a narrowing machine frame, a picot bar on the narrowing frame movable between raised inoperative and downward operative positions, a fabric take-up device including a welt wire and take-up means connectible to the welt wire, a welt wire support on the picot bar arranged for the raised inoperative position of the picot bar to receive a welt wire, and for the operative position thereof to support the welt wire for connection with the take-up means, a welt wire magazine supported on the narrowing frame, means for transferring a welt wire from the magazine to said welt wire support, and pattern means for controlling the operation of said transfer means.

58. The method of operation of a multiple section flat knitting machine provided with means for performing the several operations essential for pressing off a completed set of blanks and for starting the knitting of a new set of blanks in a continuous cycle, which comprises automatically pressing off the completed set of blanks, starting a new set of blanks while leaving the yarn or yarns of the last course attached to the fabrics comprised by the previous set of blanks, and after the commencement of knitting in the new set of blanks, cutting off and binding said yarn or yarns attached to the pressed-off set of blanks.

59. The method of operation of a flat full-fashioned knitting machine provided with means for performing the several operations essential for pressing off a completed fabric, and for starting the knitting of a new blank in a continuous cycle including knitting devices, devices cooperating therewith to set up a new fabric, and means to press off the completed fabric, which comprises continuously operating the machine to press off each fabric upon completion thereof, to set up

and knit a new fabric, and after the commencement of the new fabric, to cut off and bind the yarn or yarns attached to the pressed-off fabric.

60. The method of operating a flat full-fashioned knitting machine provided with means for performing the several operations essential for pressing off a full-fashioned stocking blank and for starting the knitting of a new blank in a continuous cycle including knitting needles, a welt mechanism, a fabric take-up mechanism, and means for operatively connecting the take-up with a welt wire which comprises continuously operating the machine to press off from the needles and to discharge each knitted article from the machine upon completion thereof, to reset the fabric take-up mechanism, to set up a new fabric on the machine, and to operatively connect the welt wire and take-up to take up the fabric.

61. The method of operation of a flat knitting machine for knitting welted fabrics provided with means for performing the several operations essential for pressing off a completed fabric and for starting the knitting of a new fabric in a continuous cycle including welt mechanism, fabric take-up mechanism, and means for operatively connecting the take-up with the welt wire, means to reset the fabric take-up, and means for re-positioning the take-up resetting means which comprises automatically and while the machine is continuously running pressing off from the needles and discharging from the take-up the completed fabric, and welt wire associated therewith, setting up and knitting a new fabric, resetting the fabric take-up mechanism, re-positioning the take-up resetting means, and operatively connecting the welt wire and take-up to take up the fabric.

62. The method of operating a flat full-fashioned knitting machine provided with means for forming the several operations essential to the pressing off of a welted stocking blank and for starting the knitting of a new blank, in a continuous cycle, including means to press off the completed blank from the needles, means for mechanically setting up and turning the welt, a welt wire magazine, and a take-up device operable to engage with a welt wire from the magazine to take up and subsequently to discharge the welt wire and fabric from the machine, which comprises operating the machine continuously to press off from the needles and to discharge from the take-up the completed fabric and welt wire associated therewith to start knitting a new fabric, and after the commencement of knitting in the new set, to cut off and bind the yarn or yarns attached to the pressed-off set.

63. The method of operating a flat full-fashioned knitting machine provided with means for forming the several operations essential to the pressing off of a welted stocking blank and for starting the knitting of a new blank, in a continuous cycle, including means to press off the completed blank from the needles, means for mechanically setting up and turning the welt, a welt wire magazine, and a take-up device operable to engage with a welt wire from the magazine to take up and subsequently to discharge the welt wire and fabric from the machine, which comprises operating the machine continuously to press off from the needles and to discharge from the take-up the completed fabric and welt wire associated therewith to start knitting a new fabric, and during the knitting of the welt portion of the fabric to operatively connect the take-up and a welt wire from the magazine to take up the fabric.

64. The method of operation of a flat full-fashioned knitting machine having knitting devices and mechanism for mechanically setting up and turning the welt, a welt wire, a fabric take-up, and means for operatively connecting the take-up with the welt wire to take up the fabric and subsequently to discharge the fabric and welt wire from the take-up, which comprises automatically pressing off and depositing the fabric in a container separate from the machine take-up while leaving the yarn of the last course unsevered during and after such press-off, automatically starting a new set, and after the commencement of knitting in the new set, cutting off and binding the yarn attached to the pressed-off set.

65. The method of operation of a flat knitting machine arranged for knitting welted fabrics provided with means for performing the several operations essential for pressing off a completed set and for starting a new set in a continuous cycle including knitting needles, means to press off the completed fabric, a fabric take-up arranged to draw off the fabric as knitted and upon the pressing off of the completed fabric to discharge the fabric from the take-up, and means for setting up a new fabric which comprises continuously operating the machine to press off the completed fabric and to arrest the take-up action of the take-up to discharge the completed fabric from the take-up, and to set up and start the knitting of a new fabric.

66. The method of operation of a multiple section flat knitting machine provided with means for performing the several operations essential for pressing off a completed set of blanks and for starting the knitting of a new set of blanks in a continuous cycle including fabric take-up means arranged to draw off the fabrics as knitted and upon the pressing off of the completed fabrics to discharge the fabrics from the take-ups, which comprises automatically pressing off the completed set of blanks and discharging the completed fabrics from the take-up means, starting a new set of blanks while leaving the yarn or yarns of the last course attached to the fabrics comprised by the previous set of blanks, and after the commencement of knitting in the new set of blanks, cutting off and binding said yarn or yarns attached to the pressed off set of blanks.

67. The method of operation of a multiple section flat knitting machine provided with means for performing the several operations essential for pressing off a completed set of blanks and for starting the knitting of a new set of blanks in a continuous cycle including knitting devices, mechanically acting devices for setting up new fabrics and means to press off the completed fabrics which comprises automatically pressing off the completed set of blanks, actuating said devices to set up and start the knitting of a new set of blanks while leaving the yarn or yarns of the last course attached to the fabrics comprised by the previous set of blanks, and after the commencement of knitting in the new set of blanks, cutting off and binding said yarn or yarns attached to the pressed off set of blanks.

68. In a flat knitting machine arranged for mechanically turning the welt, a welt wire, a support on which the welt wire is positioned, fabric take-up means associated with the welt wire, means acting when rendered operative to cause the welt wire to engage with and take up a fold of welt fabric, means to cause the com-

pleted fabric to be pressed off from the needles, and means acting thereupon to discharge the completed fabric from the machine.

69. In a flat knitting machine arranged for mechanically turning the welt, a welt wire, a support on which the welt wire is positioned, fabric take-up means associated with the welt wire, means for automatically imparting relative positioning movements to the take-up and support to operatively connect the welt wire and associated take-up means to take up the fabric, means to cause the completed fabric to be pressed off from the needles, and means acting thereupon to discharge the completed fabric from the machine.

70. In a multiple section full-fashioned knitting machine having welt turning mechanism associated therewith, the combination with instrumentalities for setting up and taking up the welt fabrics as knitted, fabric take-up devices including a welt wire for each section, means for supporting each of said welt wires on the machine, fabric take-up means associated with each of said welt wires, means for throwing said devices into operation simultaneously to tension the fabrics, means to cause the completed fabrics to be pressed off from the needles, and means acting thereupon to discharge the completed fabrics from the machine.

71. In a multiple section full-fashioned knitting machine having associated with each knitting section knitting devices adapted for knitting and for pressing off welted fabrics, the combination with a welt wire for each knitting section, of a welt wire take-up device associated with each section and including a single tensioning means for tensioning the welt wires associated with a plurality of knitting sections, means to cause the completed fabrics knitted on the several sections to be simultaneously pressed off from the needles, and means acting thereupon to discharge the completed fabrics from the machine.

72. In a flat knitting machine having needles and cooperating knitting instrumentalities, a fabric take-up device which comprises with a welt wire, a pair of take-up straps, welt wire engaging hooks, supporting means for said straps including a fabric take-up idler roller at the front of the machine, tensioning rollers for said straps spaced from the knitting devices a greater distance than the length of the fabric to be knitted, tensioning means acting on said tensioning rollers, and a resilient connection between said hooks and tensioning means.

73. In a flat knitting machine having needles and cooperating instrumentalities, a fabric take-up device which comprises with a welt wire, a pair of endless take-up straps, welt wire engaging hooks, supporting means for said straps including a fabric take-up idler roller at the front of the machine, tensioning rollers for said straps spaced from the knitting devices a greater distance than the length of the fabric to be knitted, tensioning means acting on said tensioning rollers, a resilient connection between said hooks and tensioning means, and means for rotating said tensioning rollers in a reverse direction to reset the fabric take-up.

74. In a flat knitting machine arranged to produce welted garments, a fabric take-up device which comprises with a welt wire, a pair of endless take-up straps, means operatively connecting the welt wire with the take-up straps, take-up tensioning means arranged to act on said straps to take up the fabric, and a resilient connection in said take-up device between the connecting means and the take-up tensioning means, the return portions of said take-up straps being supported and arranged to permit free operation of said resilient connection.

75. In a flat knitting machine organized to produce welted garments, a fabric take-up which comprises with a welt wire, a pair of endless take-up straps connectible with the welt wire, tensioning means for imparting a take-up action to the straps arranged to act on the straps at a point on the machine spaced from the knitting devices a greater distance than the length of the fabric to be knitted, a welt wire support, means for positioning the take-up straps in welt wire engaging position and for applying a take-up tension thereto, means for operatively connecting the welt wire on the support with the take-up straps, and means for rendering the fabric take-up device operative to take up a fold of welt fabric.

76. In a flat knitting machine arranged for mechanically turning the welt, the combination with knitting devices including a needle series, of welt mechanism arranged for mechanically turning the welt comprising the topping of an initial welt course on the needles, a fabric take-up including tensioning means operative during the knitting of at least a portion of the welt fabric to take up a fold of the welt fabric, means for relieving the tension exerted by the fabric take-up, and control means for rendering said relieving means operative to relieve the take-up tension during the welt turning operation of topping the initial welt course back on the needle.

77. In a flat knitting machine arranged for mechanically turning the welt, the combination with knitting devices including a needle series, of welt mechanism including welt instrumentalities and mechanism for actuating said instrumentalities to turn the welt comprising the topping of an initial welt course on the needles, a fabric take-up including tensioning means operative during the knitting of at least a portion of the welt fabric to take up a fold of the welt fabric, mechanism for relieving the tension exerted by the fabric take-up, and control means for rendering said mechanisms operative to set up and subsequently to turn the welt and to relieve the fabric take-up tension during the welt turning operation of topping the initial welt course on the needles.

78. In a flat knitting machine arranged for mechanically turning the welt, the combination with knitting devices including a needle series and a main cam shaft for the machine, of welt mechanism including welt instrumentalities and mechanism for actuating said instrumentalities to turn the welt comprising the topping of an initial welt course on the needles, a fabric take-up including tensioning means operative during the knitting of at least a portion of the welt fabric to take up a fold of the welt fabric, mechanism for relieving the tension exerted by the fabric take-up including a cam rotating in unison with the cam shaft, a cam roller normally inoperative with relation to its cam, pattern mechanism for the machine, and connections controlled thereby to render said welt mechanism operative to turn the welt and simultaneously to relatively shift the cam and cam roller into operative relation to relieve the fabric take-up tension.

79. A straight knitting machine for effecting in a continuous automatic cycle of operation a complete folding and topping operation providing a multi-layer portion in a fabric including a

course topped on a subsequently formed course, and for drawing off the fabric under tension, a plurality of mechanisms for effecting the knitting, folding and topping operations, actuating means, means for drawing off the fabric, means for relieving the fabric from, and subjecting it to, the tension of said draw-off means, and pattern means for controlling the operation of said mechanisms by the actuating means, and controlling the operation of said relieving and tensioning means during said continuous automatic cycle of operation.

80. In a straight hosiery machine having knitting devices including a needle series movable as a unit and cooperating knitting elements, means for clearing the fabric from the needles during the knitting of successive courses, and means for discharging the completed fabric from said fabric clearing means and thereby from the machine, which comprises control means and means actuated thereby to cause the completed fabric to be pressed off from the needles, said clearing means being constructed and arranged to permit the discharge therefrom of the fabric when pressed off from the needles.

81. In a multiple section flat knitting machine arranged for knitting welted fabrics, fabric take-up devices associated with each of the several sections, each comprising with a welt wire, a fabric take-up attachable to the welt wire and arranged to draw off the fabric in a take-up direction, automatically operating means for returning said take-ups simultaneously into position for subsequent engagement with the welt wires, a pattern mechanism for the machine, and means actuated thereby for rendering said automatic return means operative.

82. In a multiple section flat knitting machine arranged for knitting welted fabrics, fabric take-up devices associated with each of the several sections, each comprising with a welt wire, a fabric take-up attachable to the welt wire and arranged to draw off the fabric in a take-up direction, automatically operating means for returning said take-ups simultaneously into position for subsequent engagement with the welt wires, and for rendering said take-up devices operative to take up the fabrics, a pattern mechanism for the machine, and means controlled by said pattern mechanism for rendering said automatic return means operative, and for throwing said fabric take-up devices into operation.

83. In a multiple section flat knitting machine arranged for knitting welted fabrics, fabric take-up devices associated with each of the several sections, each comprising with a welt wire, a fabric take-up attachable to the welt wire and arranged to draw off the fabric in a take-up direction, automatically operating means for returning said take-ups simultaneously into position for subsequent engagement with the welt wires, retaining means for supporting the take-ups in their reset position, a pattern mechanism for the machine, and means controlled by said pattern mechanism for rendering said automatic return means operative, and subsequently for actuating said retaining means for simultaneously throwing said fabric take-up devices into operation.

84. In a flat full-fashioned knitting machine arranged for knitting welted fabrics, the combination with welt instrumentalities arranged to receive and to take up initial welt courses, of a fabric take-up for drawing off the remainder of the complete fabric comprising a welt wire and a pair of take-up straps having welt wire engaging elements connectible with the welt wire, a welt wire support, and means for effecting relative positioning movement of the strap take-up and the welt wire support to cause said welt wire engaging elements to engage with and to remove the welt wire from said support to form a fold in and to take up the remainder of the complete fabric.

85. In a multiple section flat full-fashioned knitting machine arranged for knitting welted fabrics, the combination with welt instrumentalities arranged to receive and to take up initial welt courses, of fabric take-up devices associated with the several knitting sections for drawing off the remainder of the complete fabric which comprise for each knitting section a welt wire and a pair of take-up straps having welt wire engaging elements connectible with the welt wire, a welt wire support associated with each knitting section, and means operable simultaneously at the several knitting sections for effecting relative positioning movement of the strap take-ups and the welt wire supports to cause said welt wire engaging elements to engage with and to remove the welt wire from said supports to form folds in and to take up the remainder of the complete fabrics.

86. In a multiple section flat knitting machine arranged for knitting welted fabrics, fabric take-up devices associated with the several knitting sections, which comprise for each knitting section with a welt wire, a strap take-up comprising a pair of take-up straps having welt wire engaging elements connectible with the welt wire and arranged to draw off the fabric in a take-up direction, a welt wire support associated with each knitting section, means for effecting a simultaneous return of said strap take-ups to a welt wire engaging position, and means operable simultaneously at the several knitting sections for effecting relative movement of the strap take-ups and the welt wire supports to operatively connect each of said strap take-ups including said welt wire engaging elements with the welt wires on said supports, and to take up folds of welt fabric.

87. In a multiple section flat knitting machine arranged for knitting welted fabrics, fabric take-up devices associated with the several knitting sections which comprise for each knitting section with a welt wire, a strap take-up comprising a pair of take-up straps having welt wire engaging hooks, supporting means on which said strap take-ups are movable in a take-up direction to draw off the fabric as knitted and are movable in a return direction to a reset position, a welt wire support associated with each knitting section, means for effecting a simultaneous return of said strap take-ups to a welt wire engaging position, and means operable simultaneously at the several knitting sections for effecting relative movement of the strap take-ups and welt wire supports to cause the welt wire engaging hooks to engage with and remove the welt wires from said supports, and to take up folds of welt fabric.

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