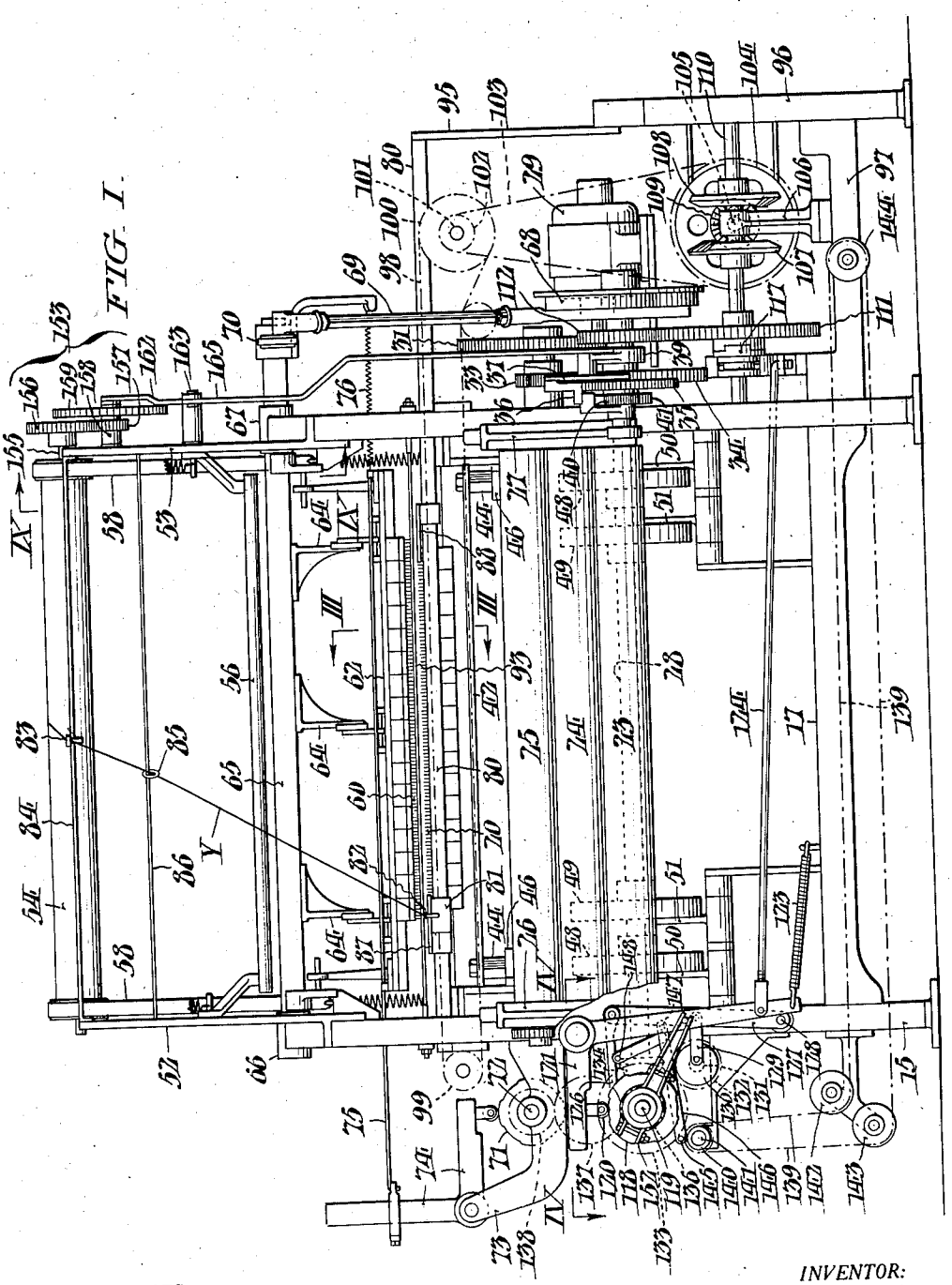
Feb. 4, 1936. G. W. LINDLEY 2,029,879

KNITTING MACHINE

Filed Dec. 23, 1932 7 Sheets-Sheet 1

FIG. I.



WITNESSES:
John C. Bergner
Thomas W. Kerr, Jr.

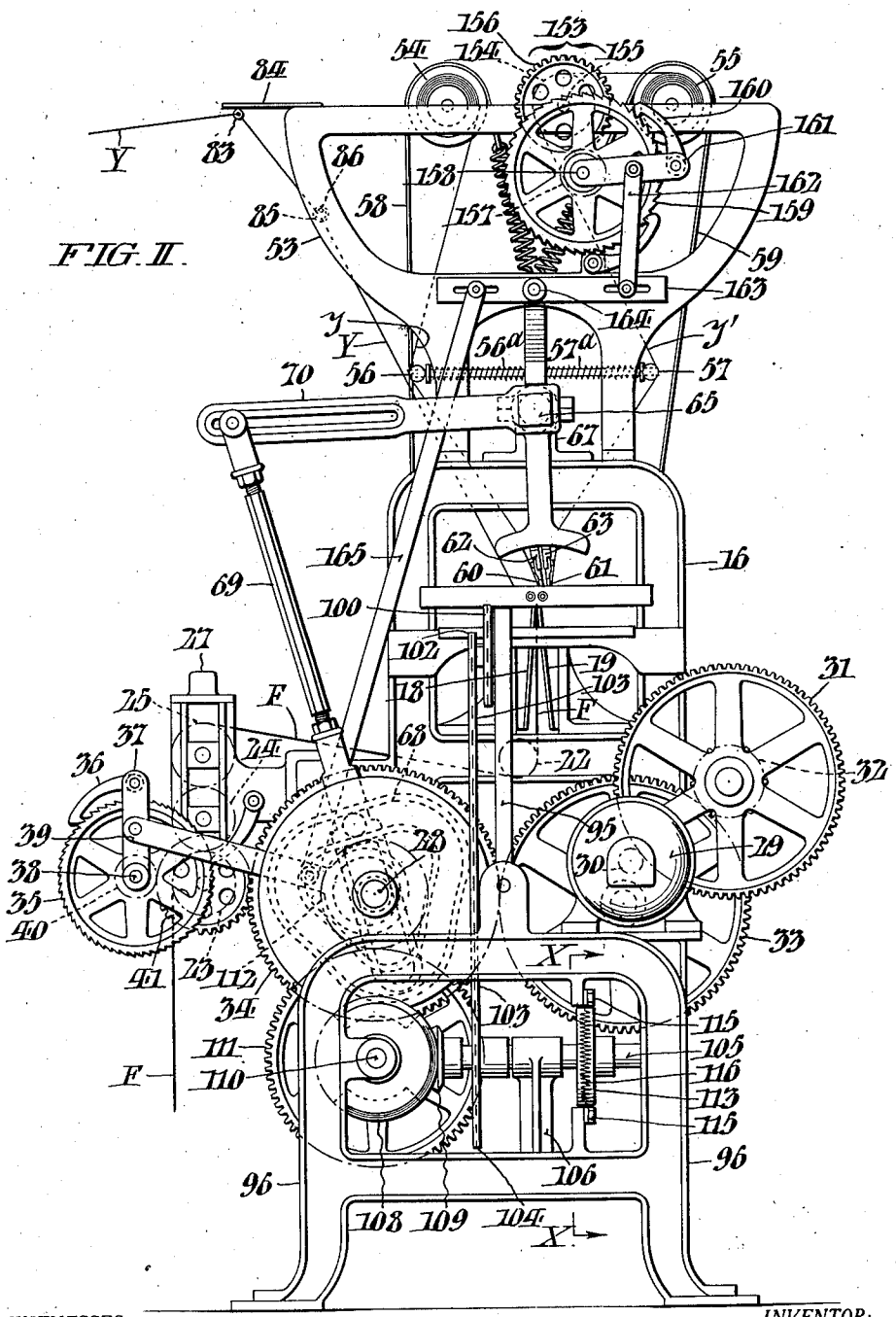
INVENTOR:
George W. Lindley,
BY Fraley & Paul
ATTORNEYS.

Feb. 4, 1936. G. W. LINDLEY 2,029,879

KNITTING MACHINE

Filed Dec. 23, 1932 7 Sheets-Sheet 2

FIG. II.



WITNESSES:
John C. Bergner
Thomas W. Kerr, Jr.

INVENTOR:
George W. Lindley,
BY Fraley & Paul
ATTORNEYS.

Feb. 4, 1936. G. W. LINDLEY 2,029,879

KNITTING MACHINE

Filed Dec. 23, 1932 7 Sheets-Sheet 3

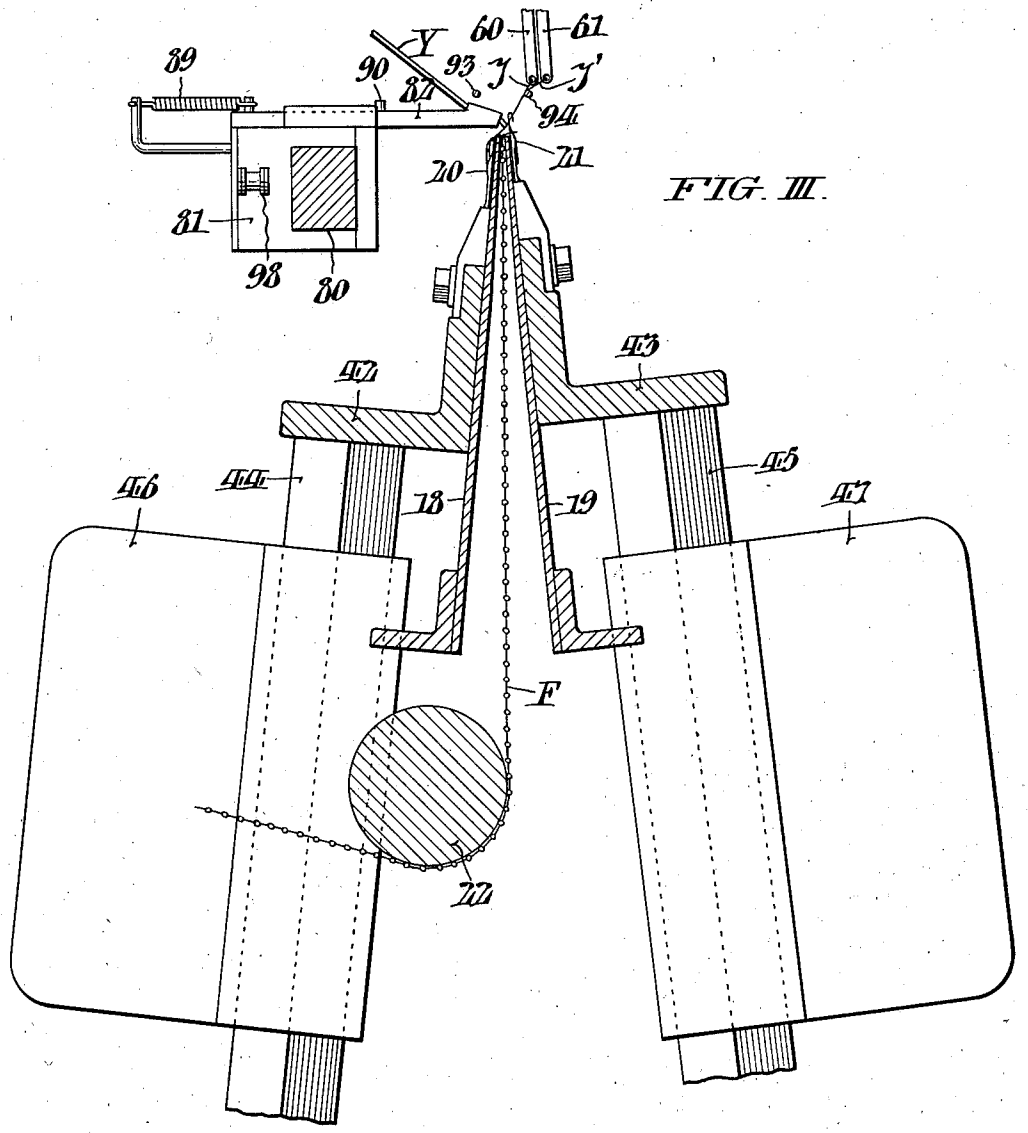


FIG. III.

WITNESSES:
John C. Bergner
Thomas W. Kerr, Jr.

INVENTOR:
George W. Lindley,
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Feb. 4, 1936. G. W. LINDLEY 2,029,879

KNITTING MACHINE

Filed Dec. 23, 1932 7 Sheets-Sheet 4

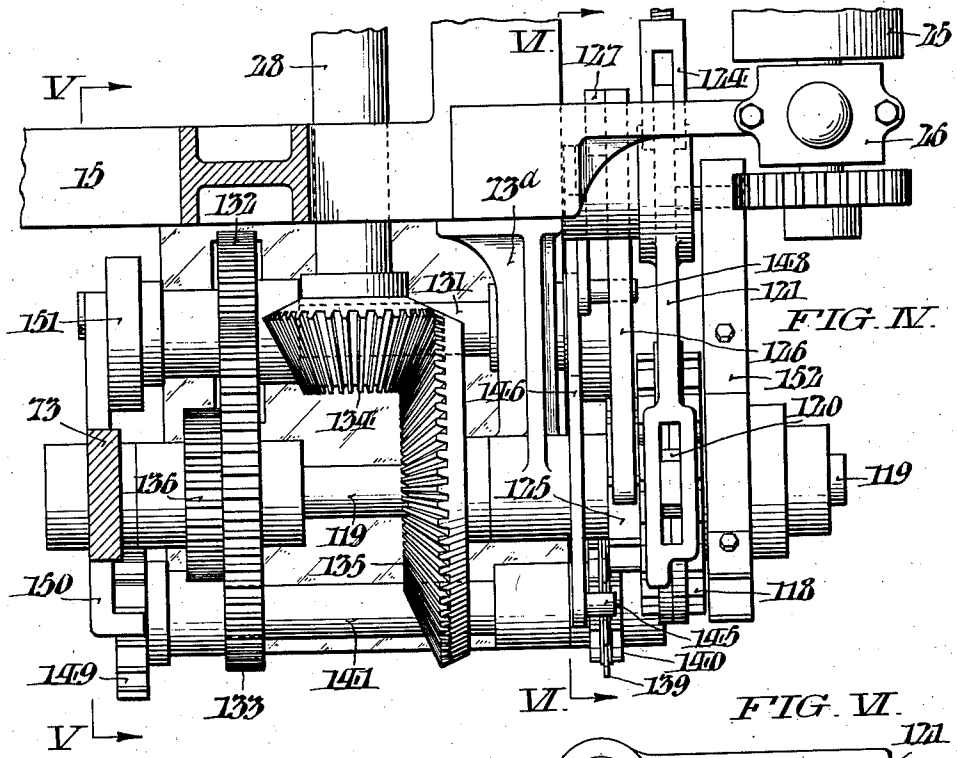


FIG. IV.

FIG. VI.

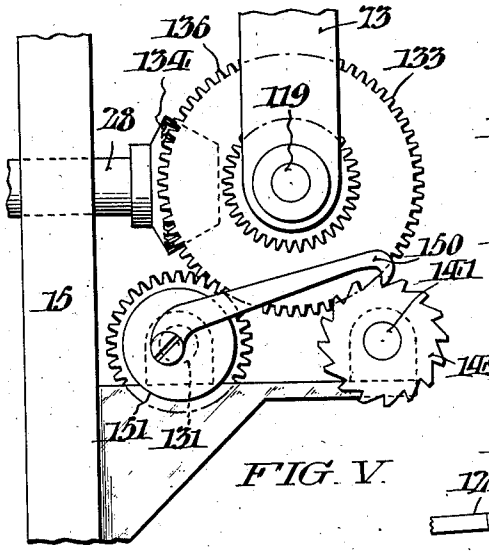
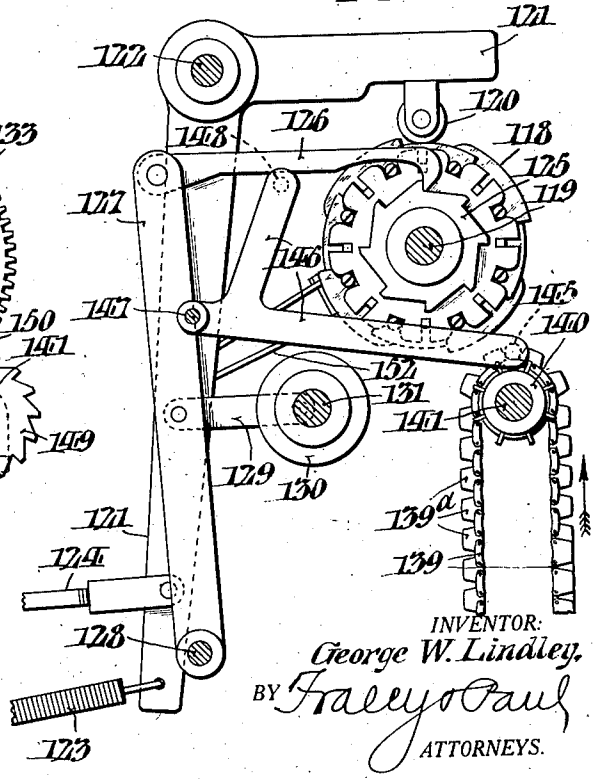


FIG. V.



WITNESSES:

John C. Bergner.

Thomas W. Kerr, Jr.

INVENTOR:

George W. Lindley.

BY Fraley & Paul

ATTORNEYS.

Feb. 4, 1936. G. W. LINDLEY 2,029,879

KNITTING MACHINE

Filed Dec. 23, 1932 7 Sheets-Sheet 5

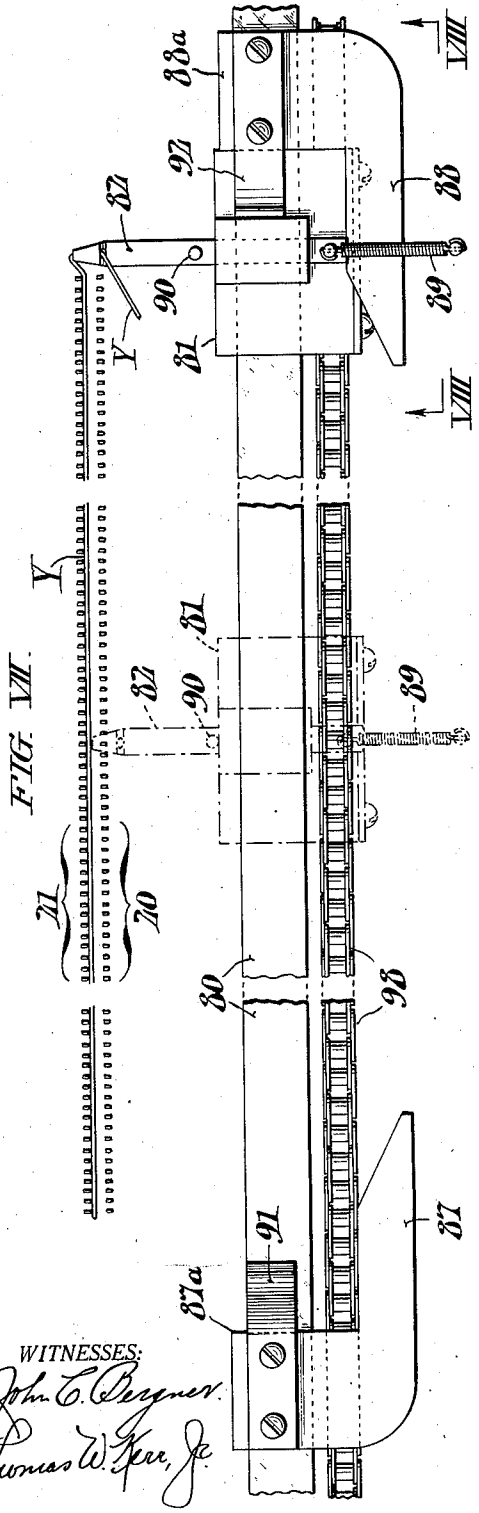


FIG. VII.

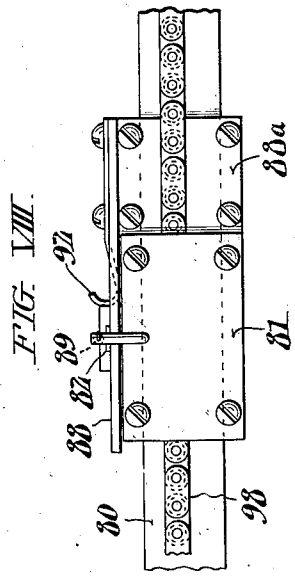


FIG. VIII.

WITNESSES:
John C. Bergner.
Thomas W. Kerr, Jr.

INVENTOR:
George W. Lindley,
BY Fraley & Paul
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Feb. 4, 1936. G. W. LINDLEY 2,029,879

KNITTING MACHINE

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FIG. IX.

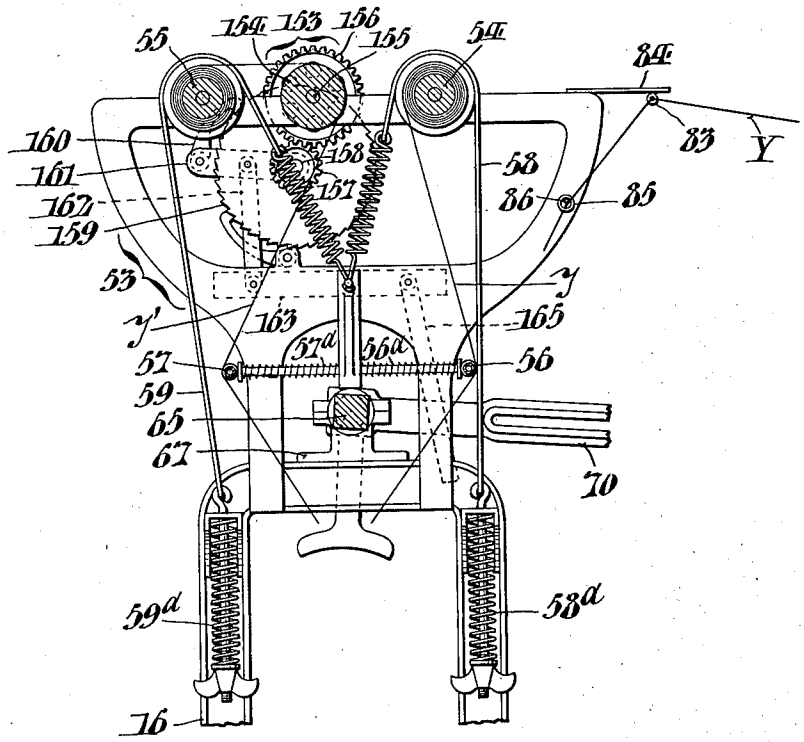
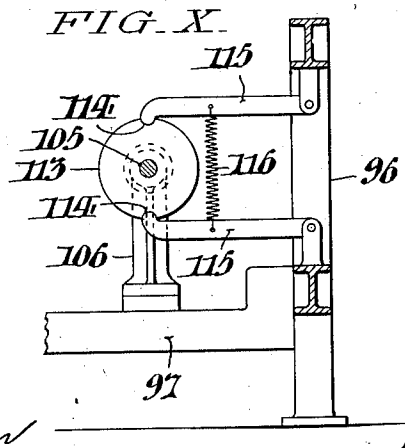


FIG. X.



WITNESSES

John C. Bergner

Thomas W. Kerr, Jr.

INVENTOR:

George W. Lindley,

BY Fraser & Paul

ATTORNEYS.

Feb. 4, 1936. G. W. LINDLEY 2,029,879

KNITTING MACHINE

Filed Dec. 23, 1932 7 Sheets-Sheet 7

FIG. XIII.

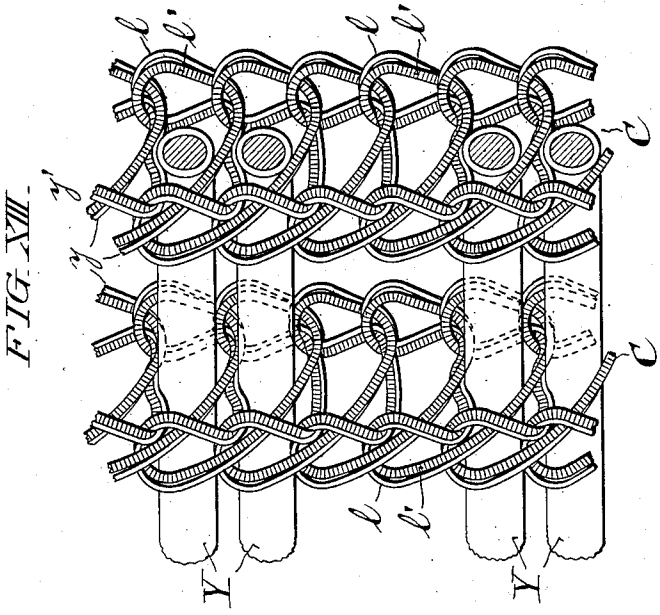


FIG. XII.

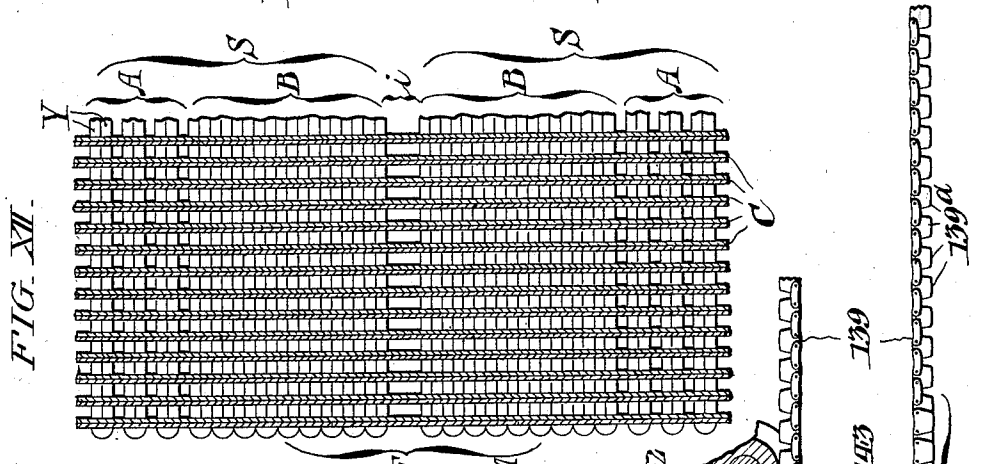
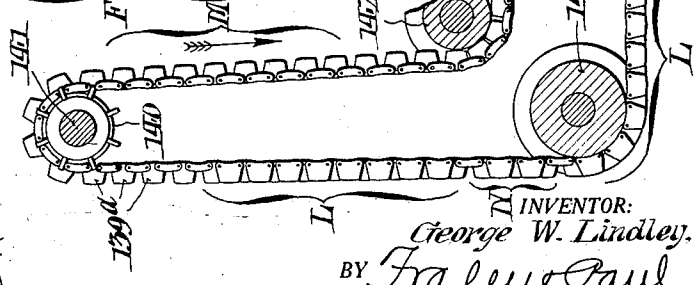


FIG. XI.



WITNESSES:

John C. Bergner

Thomas W. Kerr Jr.

INVENTOR:

George W. Lindley.

BY Fraley & Paul

ATTORNEYS.

Patented Feb. 4, 1936

2,029,879

UNITED STATES PATENT OFFICE

2,029,879

KNITTING MACHINE

George W. Lindley, Philadelphia, Pa.

Application December 23, 1932, Serial No. 648,524

15 Claims. (Cl. 66—84)

This invention relates to flat knitting machines; and it has reference more particularly to what are known as "warp" knitting machines wherein opposing sets of needles are reciprocated contrariwise en masse, and wherein warp yarns are individually served to the needles by shiftable oscillating guides or feeds.

In its broadest aspect, my invention is directed toward improvements in connection with knitting machines of the specifically mentioned type which will enable production of porous elastic fabrics suitable to the manufacture of corsets, therapeutic garments, etc.

An object of my invention is to provide reciprocating carrier means capable of laying elastic weft yarn between the loop rows respectively formed by the opposing needle sets of the machines from the individual warp yarns, in such manner as to avoid tensioning of said weft yarn and distortion of the resulting fabric.

Another object of my invention is to provide automatic means capable of variantly controlling active and inactive periods of the reciprocating weft yarn carrier, to predetermine in the fabric, sections of definite lengths which are characterized by porous infield areas and solid knit borders and which are separated by transverse cutting intervals wherefrom the inlay weft is entirely omitted.

A further object of my invention is to provide regulatable means whereby the feeding of the elastic warps to the needles may be accurately controlled for maintenance of a definite and uniform tension on them in instances where lengthwise stretching of the fabric is desirable, likewise with a view toward insuring evenness of texture and preventing distortion.

Still other objects and attendant advantages of this invention will be manifest from the detailed description following of the attached drawings, wherein Fig. I is a rear elevation of a warp knitting machine conveniently incorporating the present improvements.

Fig. II shows the right hand end elevation of the machine.

Fig. III is a fragmentary cross sectional view of the machine taken as indicated by the arrows III—III in Fig. I and drawn to a larger scale.

Fig. IV is a horizontal detail sectional view likewise drawn to a larger scale taken as indicated by the arrows IV—IV in Fig. I.

Fig. V and VI are fragmentary detail sectional views taken as indicated respectively by the arrows V—V and VI—VI in Fig. IV.

Fig. VII is a fragmentary detail plan view showing the means for laying the elastic inlay yarn between the opposing chain loops formed by the two banks of needles of the machine.

Fig. VIII is a detail illustration viewed as indicated by the arrows VIII—VIII in Fig. VII.

Fig. IX is a detail sectional view taken as indicated by the arrows IX—IX in Fig. I.

Fig. X is a detail sectional view taken as indicated by the arrows IX—IX in Fig. II.

Fig. XI is a fragmentary detail view of the pattern and measuring chain of the machine.

Fig. XII is a diagrammatic fragmentary view of one form of elastic fabric such as may be produced with the machine of my invention; and

Fig. XIII is a fragmentary detail sectional view of the fabric on an exaggerated scale showing diagrammatically how the chain loops knit by the two banks of the needles are interconnected to embrace the elastic inlay yarn.

The knitting machine herein illustrated is, generally speaking, of standard and well known design and construction, with a frame comprising two main transverse members 15, 16, and a number of lengthwise girts, whereof one is indicated at 17 in Fig. I, that rigidly connect the said transverse members in definitely spaced relation.

Supported between the frame members 15, 16 at the longitudinal center of the machine, are the usual counter-inclined knock-over plates 18, 19, (Fig. III). As shown, these plates 18, 19 closely approach each other at their top edges so as to form a narrow slit for passage of the fabric F which is produced jointly by the two opposed sets of needles indicated at 20, 21. After passing downward through the interval between the knock-over plates 18, 19, the fabric is guided around an idler roll 22 (Fig. III) and thereby directed horizontally to the rear of the machine for passage about and between a group of vertically arranged draft rolls 23, 24, 25 which are journalled at their ends in brackets 26, 27 secured to the transverse frame components 15, 16.

All the movements of the machine are derived from a longitudinally-extending main shaft 28 supported for rotation in suitable bearings afforded by the transverse frame members 15, 16. Power for driving the machine is provided by an electric motor indicated at 29 in Figs. I and II, and transmitted, at greatly reduced speed through a train of spur gear wheels 30, 31, 32, 33 and 34, to the main shaft 28. The draft rollers 23—25 are intergeared for rotation in unison, and intermittently actuated through picking of a ratchet wheel 35 by a pawl 36 at the end of an arm 37, which is free on the shaft 30

of the ratchet, and oscillated by virtue of an eccentric rod connection 29 with the main shaft 28. The ratchet shaft 30 is supported by a bracket 27 and coordinated with the lowermost roller 23 of the draft group 23—25 by a pair of spur gears 40, 41, see Fig. II. The horizontal angle bars 42, 43 (Fig. III) carrying the needle banks 20, 21 are attached to vertical slide bars 44, 45 which are confined to up and down movement in guides 46, 47 secured to the in sides of the transverse frame members 15, 16. The needle banks 20, 21 are reciprocated contrariwise to form successive fabric loops in a known manner, by rotary cams 48, 49 (Fig. I) on the main shaft 28, said cams acting upon roller arms 50, 51 with connection to the lower ends of the slide bars 44, 45.

Reaching upward from the transverse components 15, 16 of the machine frame are supplemental brackets 52, 53 that rotatively support overhead beams 54, 55 wherefrom warp yarns y, y' are individually supplied to the needles of the banks 20, 21, said yarns passing en route over pivotally suspended spreader bars 56, 57 which extend longitudinally of the front and back of the machine, and which are urged outward yieldingly by springs 56a, 57a, see Fig. II. The beams 54, 55 are held in restraint by friction bands 58, 59 which are subject to adjustable tension springs 58a, 59a as best shown in Fig. IX. The guide fingers relied upon to feed the yarns y, y' to the needles 20, 21 are indicated at 60, 61, and, as usual, are carried by horizontal rods 62, 63, which are hung, with capacity for being individually shifted endwise, on brackets 64 pendant from a horizontal rock shaft 65 with journal support in bearings 66, 67 atop the transverse frame members 15, 16. Oscillatory motion is imparted to the rock shaft 65 by a side groove cam 68 on the main shaft 28, the interposed connections including a roller link 69 and an arm 70 secured to said shaft at one end. The shifting of the yarn guide rod 62, 63 is determined by a cam wheel 71 at the left hand end of the machine, see Fig. I, mounted on a stud axis 72 of a bracket 73 which is secured to the transverse frame member 15. In this instance the cam wheel 71 is formed with alternate circumferential high and low spots to influence bell crank levers 74 which are pivoted on the bracket 73 and individually coupled with the yarn guide rods 63, 61 by hook links 75. Springs 76 (Fig. I) yieldingly draw the yarn guides 60, 61 rightward and accordingly maintain the rollers on the bell crank levers 74 always in operative contact with the cam wheel 71.

In adapting a warp knitting machine such as briefly described up to this point to produce porous or open mesh elastic fabric such as shown in Figs. XII and XIII, characterized by spaced doubled strands of a comparatively heavy elastic yarn Y inlaid between doubled interconnected loops l, l' of laterally spaced detached chains C of the warp yarns y, y', hereinbefore mentioned, I make provisions as follows:

Slidingly mounted on a bar 80 (Figs. I, II, III, VII and VIII) extending longitudinally of the rear of the machine approximately at the level of the needles 20, 21, is a block 81 which carries an apertured guide finger 82 for the heavy elastic inlay yarn Y. En route to the guide finger 82, the yarn Y is first directed through an eye 83 supported by a rod 84 which extends between the brackets 52, 53 at the top of the machine and then through a traveller ring 85 free on a parallel wire 86, said yarn being supplied without tension from a suitable bulk source, not shown. As the block 81 is slid back and forth on the bar 80 the yarn Y is laid by the finger 82 between the loops formed respectively on the needles 20, 21 as shown in Fig. III. In order to prevent fouling of the yarn Y by the rear set of needles 20 as they rise, the guide finger 82 is supported with capacity to slide endwise in the block 81 so that, at each end of its strokes, it may be moved inward to depress the yarn Y around the end needles of the set 21, thereby to hold it snug against the backs of the intermediate needles of said set as shown in Fig. VII. Such inward shifting of the finger 82 is effected by a pair of cam plates 87, 88 affixed to the bar 80 beyond the end needles of the sets 20, 21, upon the outer end of the finger in opposition to a tension spring 89, the outward movement of said finger being limited by contact of a stud 90 thereon with the block 81, as shown in dot and dash lines in Fig. VII. Leaf springs 91, 92 (Figs. VII and VIII) operate to frictionally hold the block 81 against rebounding as it strikes the limiting stops 87a, 88a whereto the cam plates 87, 88 are directly secured. A pair of longitudinally extending guide wires 93, 94 immediately above the needles 20, 21, prevent interference of the inlay yarn server 82 with the warp yarns y, y'.

From Fig. I it will be noted that the guide bar 80 for the slide block 81 extends beyond the transverse frame member 16 at the right hand end of the machine, and that it is there supported by a strut 95 upstanding from a supplemental end frame member 96 which is connected by girts 97 to said frame member 16. As a means for shifting the slide block 81 back and forth on the bar 80, there is shown a chain 98 which is trained about sprocket wheels 99 and 100 suitably supported by the machine frame. Secured on the same shaft 101 with the sprocket wheel 100, is a sprocket pinion 102 which is coordinated, by means of another chain 103, with a sprocket wheel 104 on a transverse countershaft 105 journalled in fixed bearings 106. The shaft 105 is reversely rotated by action of a pair of opposed mutilated bevel gears 107, 108 upon an intermeshing bevel pinion 109 on said shaft. The mutilated bevel gears 107, 108 are secured to a longitudinal shaft 110 which is journalled at its opposite ends in the frame members 16, 96, and carries a spur gear 111 in mesh with a spur pinion 112 on the main shaft 28. The proportioning of the gearing just described is such as to determine a half revolution of the shaft 105 in each direction, this motion being sufficient to cause the yarn finger 82 to be traversed the length of the needle sets 20, 21 in each direction. Excess rotation of the shaft 105 under its own momentum is prevented by a stop disk 113, (Figs. II and X) which is secured to said shaft and formed in its periphery with diametral notches 114 for engagement respectively by a pair of detents 115. As shown in Fig. X, these detents 115 are pivoted to the supplemental end frame member 96 of the machine and urged into contact with the periphery of the stop disk 113 by a connecting tension spring 116.

In order that the serving of the inlay yarn Y may be interrupted when desired or required, a suitable clutch 117 is provided for disconnecting the gear wheel 111 at such times, from the shaft 110. This clutch 117 is controlled by another cam wheel 118 located at the left hand end of the machine (Fig. I) beneath the cam wheel 71 here-

inbefore referred to, said cam wheel having alternate high and low spots in its circumference and being free to rotate about a shaft 119 journalled at one end in the bracket 73, and at the other end in another bracket 73a, see Figs. IV and VI also. On the cam wheel 118 rides the roller 120 of a bell crank lever 121 which is fulcrumed on a fixed center 122, said lever being subject to a spring 123 and connected by a rod link 124 with the clutch 117. Secured to the cam wheel 118 is a ratchet wheel 125 which is picked by a pawl 126 on an arm 127 having pivotal support at 128 and connected by a link 129 to an eccentric disk 130 on the countershaft 131. This countershaft 131 is continuously rotated, through the medium of a pair of intermeshing spur gears 132, 133 (Figs. IV and V), from the shaft 119 whereon the cam wheel 118 is loosely mounted; and said shaft 119 is in turn driven by a pair of intermeshing bevel gears 134, 135 from the main shaft 28. In this connection it is to be noted that the cam wheel 71 for actuating the yarn guide fingers 60 and 61 is constantly rotated by a train of gears 136, 137 and 138 (Figs. I and IV) from the shaft 119. Pawling of the cam wheel 118 is governed by an endless pattern and measuring chain 139, which, after rounding a sprocket pinion 140 on the shaft 141 adjacent the shaft 131 (Figs. I, IV, V and VI), passing downward about guide rollers 142, 143 and then horizontally along the rear of the machine from the left hand end to an idler sprocket 144 at the right hand end. As shown in Fig. VI, the pattern and measuring chain 139 has high links 139a to under-ride a stud projection 145 on one extremity of a bell crank lever 146 fulcrumed at 147. The other extremity of the bell crank lever has a stud projection 148 that underreaches the pawl 126. Accordingly, as each high link 139a of the chain 139 actuates the bell crank lever 146, the pawl 126 is lifted to prevent picking of the cam wheel 118 which controls the clutch 117 of the mechanism whereby the inlay yarn Y is served. The shaft 141 for the drive sprocket 140 of the pattern and measuring chain 139 is intermittently rotated through picking of a ratchet wheel 149 thereon by a pawl 150 actuated by another eccentric disk 151 on the shaft 131, see Fig. V. The cam wheel 118 is restrained against free rotation by a clamp brake shown at 152 in Fig. I.

With the machine arranged as described, the laterally elastic strip fabric F (Fig. XII) produced by it is subdivided, by intervals *i* from which the inlay yarn Y is entirely omitted, into sections of a definite length such as indicated at S. As shown, each section S is characterized by a porous infield area A and solid borders B at opposite ends in which the weft yarn Y is incorporated with each course of interconnected chain loops *l*, *l'* formed from the warp yarns *y*, *y'*. After cutting the loop chains C crosswise through the intervals *i*, the cut edges of the sections S are bound against ravelling by overedge stitching or looping in a manner commonly practiced in connection with edge finishing of knit goods. Variant laying of the elastic weft yarn Y to produce sectional strip fabric as just explained is predetermined by suitably arranging the high links 139a of the pattern and measuring chain 139 as shown in Fig. XI. Thus close placement of the links 139a as at L in Fig. XI determines the solid borders B of the fabric F (Fig. XII), and uniform spacing of the links as at M determine the porous knit areas A, while the closely grouped links at N determine the cutting intervals *i*. By using two plain links between contiguous high links 139a of the chain 139 in the portions M, it is possible to predetermine single strand laying of the inlay yarn Y instead of the doubling of said yarn as exemplified in Fig. XII. Also, by rearranging the cam wheel 71 (Fig. I) which controls the shogging of the warp yarn feeds 60, 61, it is possible to predetermine lateral interconnection of the loop chains C (Fig. XII) in a manner which will be readily understood by those skilled in the use of warp knitting machines. In the skips or open intervals of the fabric, the spaced strands of the inlay yarn Y are vertically connected by continuance along the right hand selvage edge of the fabric.

To produce knit fabric which is elastic only in one direction, I preferably employ either cotton or silk yarns *y*, *y'* to form the double loops *l*, *l'* as in Fig. XIII. When elasticity in both directions is desired however, I use yarns *y* of silk or cotton in conjunction with silk or cotton wrapped yarns *y'* of rubber of substantially light gage. The cotton yarn, in the latter instance, is relied upon to limit the stretching of the loops formed with the elastic warps. In order to maintain the wrapped rubber yarns *y'* under a definite and unvarying tension during the knitting, I fit the machine, in accordance with my invention, with a tension control mechanism which is comprehensively designated by the numeral 153 in Figs. I and II. As illustrated, this tension control mechanism 153 comprises a roughened or sandpaper covered drum 154 placed alongside the beam 55 over which the yarns *y'* are passed on their way to the knitting instrumentalities of the machine. The shaft 155 of the drum 154 is suitably journalled at its ends in the brackets 52, 53, and carries a spur gear 156 that meshes with a spur pinion 157, the latter being mounted on a shaft 158 together with a ratchet wheel 159. This ratchet wheel 159 is picked by a pawl 160 at the end of an oscillating arm 161 free to oscillate on the ratchet shaft 158. By means of a link 162, the arm 161 is pivotally connected with provision for adjustment, to one extremity of a lever 163 centrally fulcrumed at 164 to the bracket 53 and whereof the other extremity is pivoted, likewise with capacity for adjustment, to the upper end of a drop link 165, the lower end of the said link being in turn pivotally connected to the eccentric link 39 hereinbefore described in connection with the fabric takeup mechanism. As a consequence of the last described arrangement, the yarns *y'* are positively progressed a predetermined increment during each rotation of the main shaft 28 to supply a definite amount of yarn *y'* at a uniform tension to the needles 20, 21 for each course of the knitting, with resultant production of fabric which is free from distortion. The amount of yarn so supplied may be increased or decreased as desired or required through adjustment of the pivotal connections of the links 162, 165 with the centrally-fulcrumed lever 163.

From the foregoing, it is evident that the machine of my invention is adaptable to the knitting of warp fabric, with inlay or weft yarn, which is elastic in one or both directions, as well as fabric without wefts which is elastic in both directions within predetermined limits.

Having thus described my invention, I claim:

1. In a straight knitting machine, two opposing contrariwise actuated sets of needles; means for serving yarn to the needles for formation of fabric loops; a reciprocating carrier for laying another yarn transversely of the fabric between the loops

respectively formed by the two sets of needles; and means for automatically thrusting said carrier inward at the completion of its strokes in opposite directions to hold the inlay yarn against the backs of the needles of one set when such needles are raised, and thereby to prevent it from being fouled as the other set of needles rises.

2. In a warp knitting machine, two opposing contrariwise actuated sets of needles; shiftable feeds for serving individual warp yarns to the needles; a reciprocating carrier to lay weft yarn between the loops respectively formed by the needles of the two sets for incorporation in the fabric produced by the machine; and means for automatically thrusting said carrier inward at the completion of its strokes in opposite directions to hold the weft yarn taut but without tension, against the backs of the needles of one set when such needles are raised, and thereby to prevent it from being fouled as the other set of the needles rises.

3. In a warp knitting machine comprising two opposing contrariwise actuated sets of needles; shiftable fingers for serving individual warp yarns to the needles; a reciprocating guide finger for laying weft yarn, taut but without tension, between the loops respectively formed by the two sets of needles to incorporate it in the fabric produced by the machine; a slide for the finger; a spring normally holding the finger retracted in the slide; and cam means for automatically thrusting the finger inward at the end of its strokes in opposite directions, to hold the weft yarn, taut but without tension, against the backs of the needles of one set when such needles are raised, and thereby to prevent it from being fouled as the other set of needles rises.

4. In a warp knitting machine, two opposing sets of needles; shiftable feeds to serve individual warp yarns to the needles; a reciprocating carrier for laying weft yarn between the loops respectively formed by the needles of the two sets for incorporation in the fabric produced by the machine; and mechanism for reciprocating the carrier including a chain, a drive sprocket therefor, a bevel gear pinion coordinated with the sprocket, a pair of coaxially-mounted opposing mutilated bevel gears to reversely actuate the bevel pinion, and means to drive the bevel gears.

5. In a warp knitting machine, two opposing sets of needles; shiftable feeds for serving individual warp yarns to the needles; a reciprocating carrier for laying weft yarn between the loops respectively formed by the needles of the two sets for incorporation in the fabric produced by the machine; and mechanism for reciprocating the carrier including a chain connected to said carrier, a sprocket wheel engaging the chain, drive means for reversely actuating the sprocket, a clutch means whereby the sprocket may be disconnected from its drive means, and automatic means for controlling the clutch to determine variant active and inactive periods of the weft thread carrier.

6. In a warp knitting machine, two opposing sets of needles; shiftable feeds for serving warp yarns individually to the needles; a reciprocating carrier to lay weft yarn between the loops respectively formed by needles of the two sets for incorporation in the fabric produced by the machine; a chain connected to the carrier; a sprocket wheel engaging the chain; drive means for reversely actuating the sprocket wheel; a clutch whereby the sprocket may be disconnected from its drive means; a cam wheel with high and low spots to control shifting of the clutch in determining active and inactive periods of the weft thread carrier; a pattern chain with high links; and interposed means governed by the high links of the pattern chain for intermittently rotating the cam wheel aforesaid to determine variant active and inactive periods of the weft yarn carrier.

7. In a warp knitting machine, a set of needles; shiftable means for serving individual elastic yarns to the needles; means for actuating the needles to form fabric from the elastic yarns; a draft roller for drawing the knitted fabric from the needles; means for intermittently rotating the draft roller; a beam holding a supply of the elastic yarns; means for restraining the beam against free rotation; a feed roller over which the elastic yarns are passed en route from the supply beam to the needles; and means actuated by the take-up roller progressing means aforesaid, for likewise intermittently rotating the feed roller, thereby to control feeding of the elastic yarns to the needles at a uniform rate and tension.

8. In a warp knitting machine, a set of needles; shiftable means for serving individual elastic yarns to the needles; a shaft with interposed connections for actuating the feeds and the needles to form fabric from the elastic yarns; a draft roller for drawing the knitted fabric from the needles; an eccentric on the main shaft instrumental in intermittently racking the draft roller; a beam holding a supply of the elastic yarns; means for restraining the beam against free rotation; a feed roller over which the elastic yarns are passed en route from the supply beam to the needles; and racking means actuated through connections with the eccentric aforesaid for intermittently rotating the feed roller, to control feeding of the elastic yarns to the needles at a uniform rate and tension.

9. In a warp knitting machine, a set of needles; shiftable means for serving individual elastic yarns to the needles; a shaft with interposed connections for actuating the feed and the needles to form fabric from the elastic yarns; a draft roller for drawing the knitted fabric from the needles; racking means for the draft roller actuated by an eccentric on the shaft aforesaid; a beam holding a supply of the elastic yarn; means for restraining the beam against free rotation; a feed roller over which the elastic yarns are passed en route from the supply beams to the needles; racking means for intermittently rotating the feed roller to control feeding of the elastic yarns to the needles at a uniform rate and tension; and interposed means whereby the racking means for the feed roller is actuated from the eccentric aforesaid, the last mentioned racking means embodying adjustable provisions whereby the extent of racking of the feed roller may be varied to change the feeding rate and tension of the elastic yarns.

10. In a warp knitting machine, two opposing sets of needles; shiftable feeds for serving individual elastic warp yarns to the needles; means for controlling the rate and tension at which the elastic warp yarns are fed to the needles; a reciprocating carrier to lay weft yarn between the loops respectively formed by the needles of the two sets from the elastic warp yarns, to incorporate said weft yarn in the fabric produced by the machine; and means for determining periods of activity and inactivity of the weft yarn carrier to determine a porous texture in the fabric.

11. In a warp knitting machine, two opposing sets of needles; shiftable feeds for serving individual elastic warp yarns to the needles; means for definitely controlling the rate and tension at which the elastic warp yarns are fed to the needles; a reciprocating carrier for laying weft yarn between the loops respectively formed by the two sets of needles from the elastic warp yarns to incorporate such weft yarn in the fabric produced by the machine; and means for variantly controlling active and inactive periods of the weft yarn carrier to determine a porous infield texture and close knit borders in separated sections of the fabric, as well as transverse cutting intervals in which the weft yarn is entirely absent.

12. In a warp knitting machine, two opposing sets of needles; shiftable feeds for serving individual elastic warp yarns to the needles; means for definitely controlling the rate and tension at which the elastic warp yarns are fed to the needles; means for laying elastic weft yarn, taut but without tension, between the loops respectively formed by the two sets of needles from the elastic warp yarns, to incorporate such weft yarn in the fabric produced by the machine; and means for controlling active and inactive periods of the weft yarn laying means to determine a porous texture in the fabric.

13. In a warp knitting machine, two opposing sets of needles; shiftable feeds to serve individual warp yarns to the needles; a reciprocating carrier for laying weft yarn between the loops respectively formed by the two sets of needles to incorporate it in the fabric produced by the machine; reversing rotary means for actuating the weft yarn carrier; drive means for the reversing rotary means; and pattern means controlling connection and disconnection of the reversing rotary means to and from the drive means to determine active and inactive periods of the weft yarn carrier.

14. In a warp knitting machine, two opposing sets of needles; shiftable feeds to serve individual warp yarns to the needles; a reciprocating carrier for laying weft yarn between the loops respectively formed by the two sets of needles to incorporate it in the fabric produced by the machine; and mechanism for reciprocating the weft yarn carrier including a chain, a sprocket therefor, rotary reversing means for said sprocket, drive means for the rotary reversing means, and pattern means controlling connection and disconnection of the rotary reversing means to and from the drive means to determine active and inactive periods of the weft yarn carrier.

15. In a warp knitting machine, two opposing sets of needles; shiftable feeds to serve individual warp yarns to the needles; a reciprocating carrier for laying weft yarn between the loops respectively formed by the two sets of needles to incorporate it in the fabric produced by the machine; rotary reversing means for actuating the weft yarn carrier; drive means for the rotary reversing means; and a pattern chain with interposed instrumentalities controlling connection and disconnection of the rotary reversing means to and from the drive means to determine active and inactive periods of the weft yarn carrier.

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