June 8, 1948. S. A. MONK 2,442,822

KNITTING MACHINE

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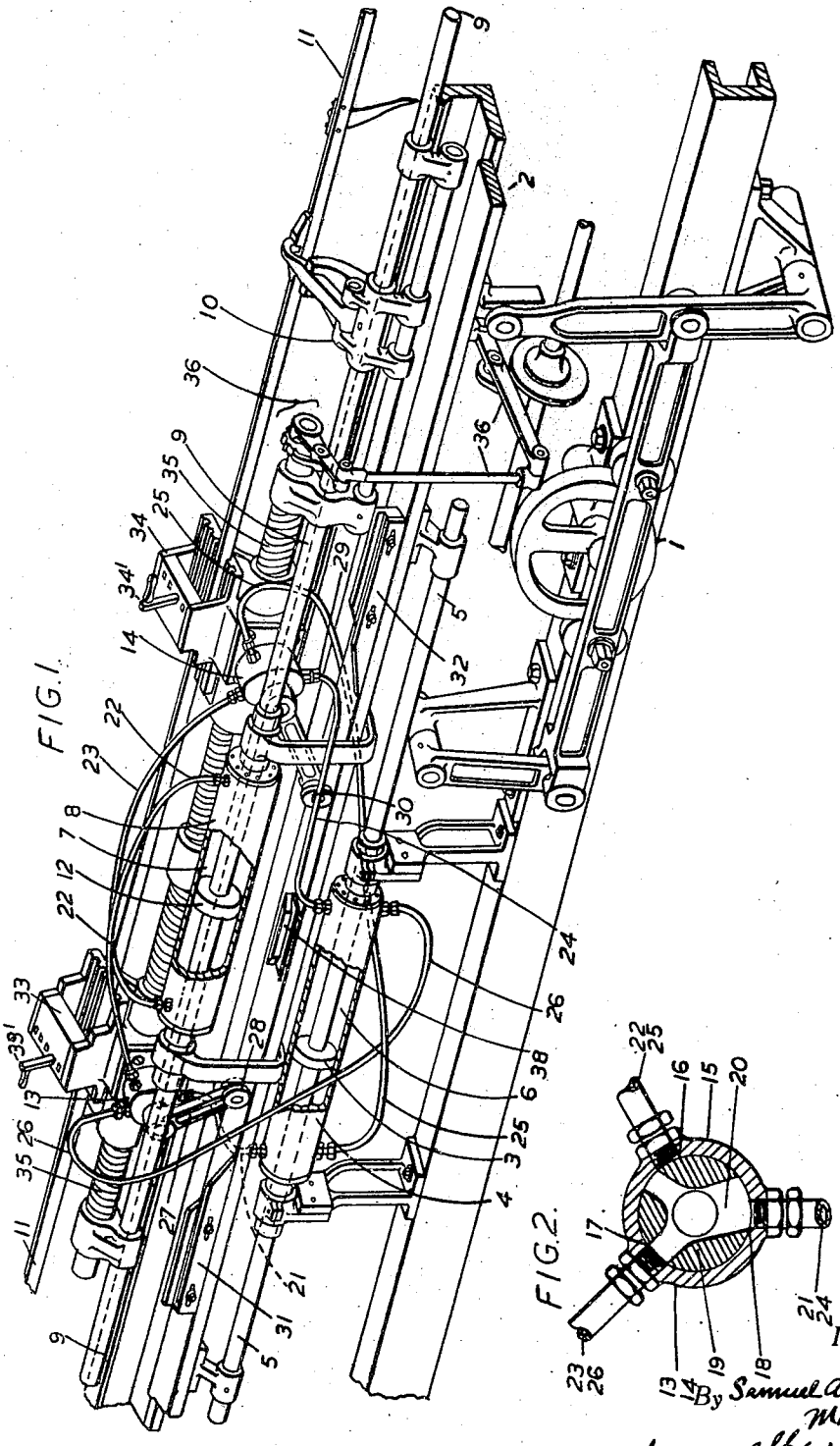


FIG. 1.

FIG. 2.

Inventor
By Samuel Arthur Monk
Attorney

June 8, 1948. S. A. MONK 2,442,822

KNITTING MACHINE

Filed Aug. 1, 1945 8 Sheets-Sheet 2

FIG. 3.

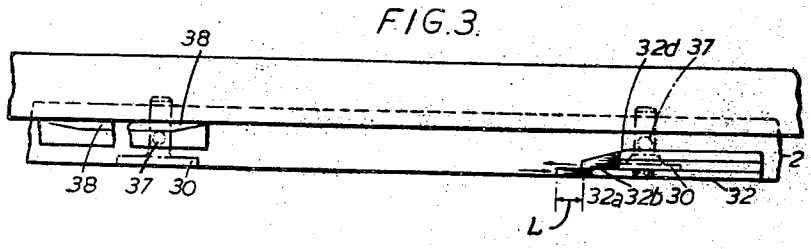


FIG. 10.

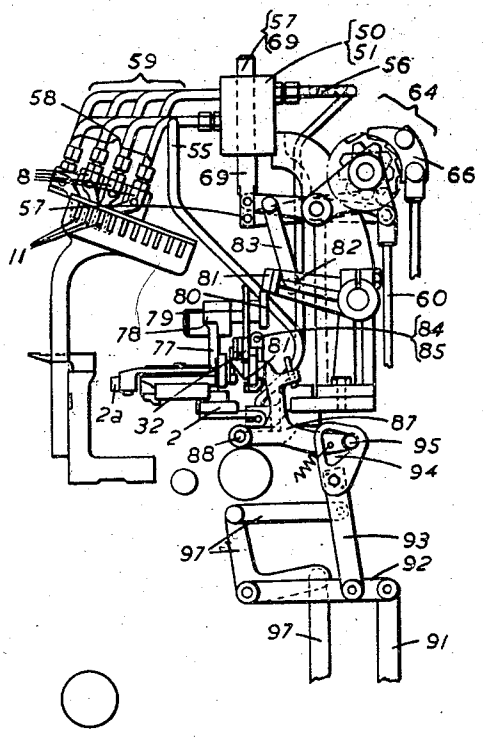


FIG. 4

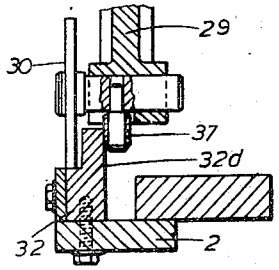
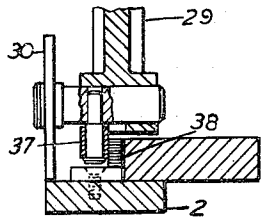


FIG. 5.



Inventor
Samuel Arthur Monk
By
Attorney

June 8, 1948. S. A. MONK 2,442,822

KNITTING MACHINE

Filed Aug. 1, 1945 8 Sheets-Sheet 3

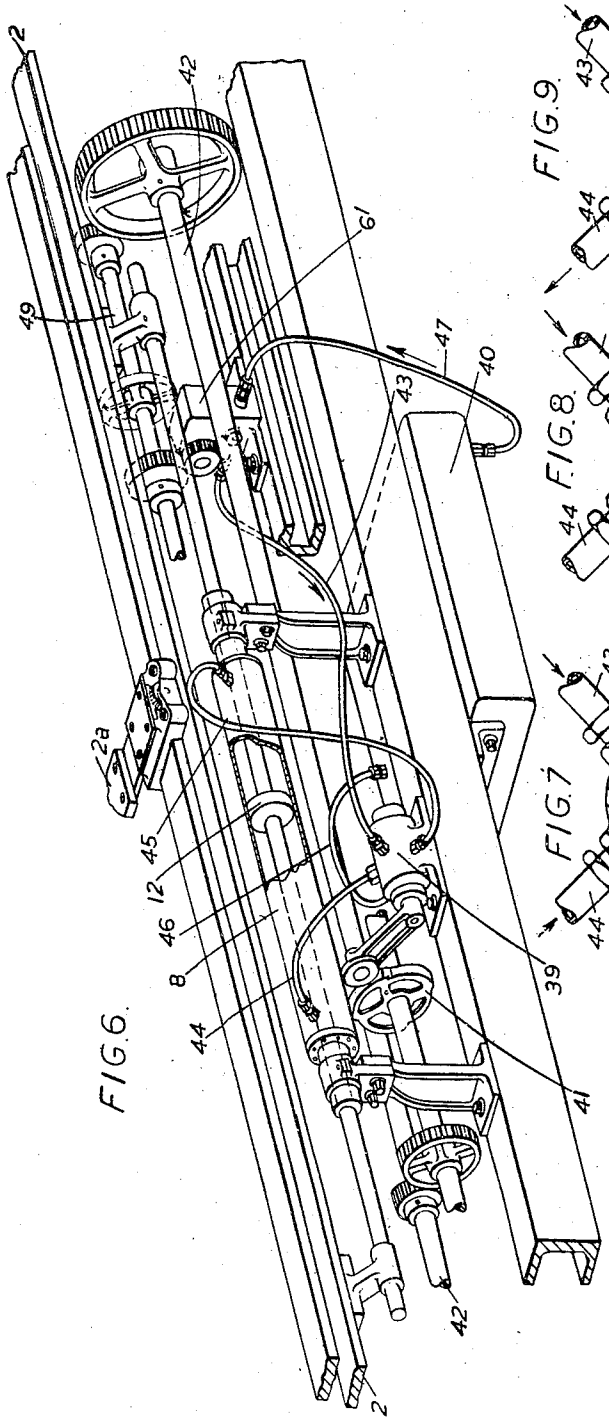


FIG. 6.

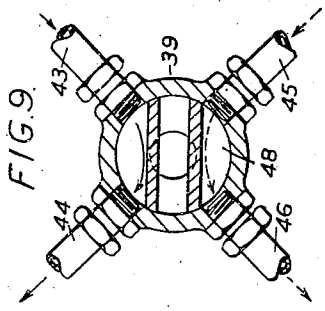


FIG. 9.

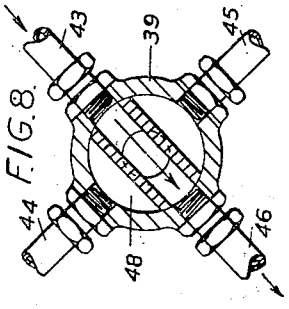


FIG. 8.

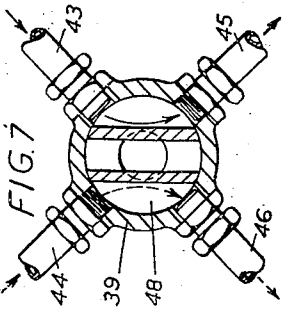


FIG. 7.

Samuel Arthur Monk Inventor

By Lindsell & Lindsell

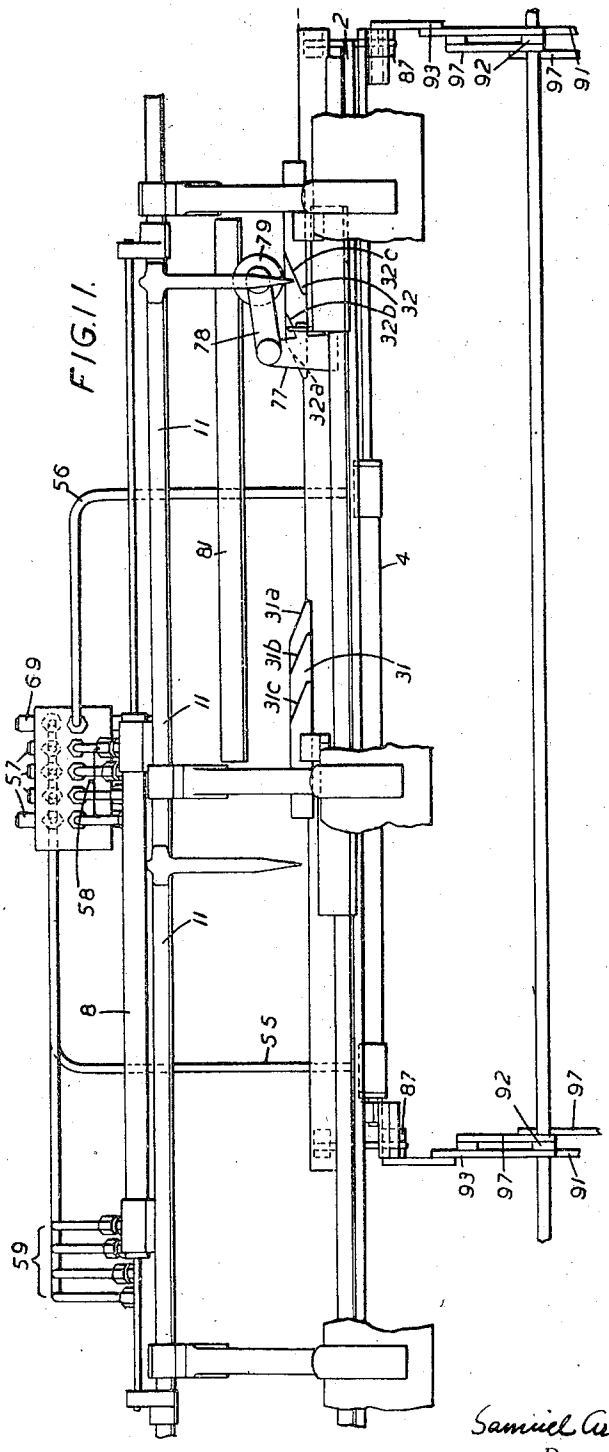
Attorney

June 8, 1948. S. A. MONK 2,442,822

KNITTING MACHINE

Filed Aug. 1, 1945 8 Sheets-Sheet 4

FIG. 11.



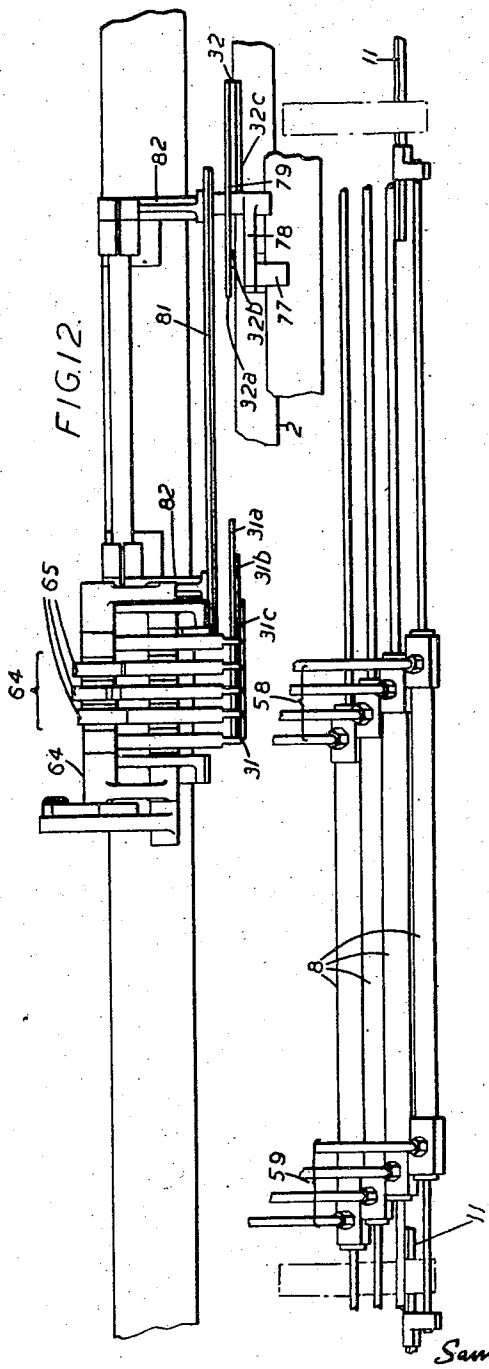
Inventor
Samuel Arthur Monk
By
Michael S. Jobb
Its Attorney

June 8, 1948. S. A. MONK 2,442,822

KNITTING MACHINE

Filed Aug. 1, 1945 8 Sheets-Sheet 5

FIG. 12.



Inventor
Samuel Arthur Mark
By
Michael & Co
Attorney

June 8, 1948. S. A. MONK 2,442,822

KNITTING MACHINE

Filed Aug. 1, 1945 8 Sheets-Sheet 6

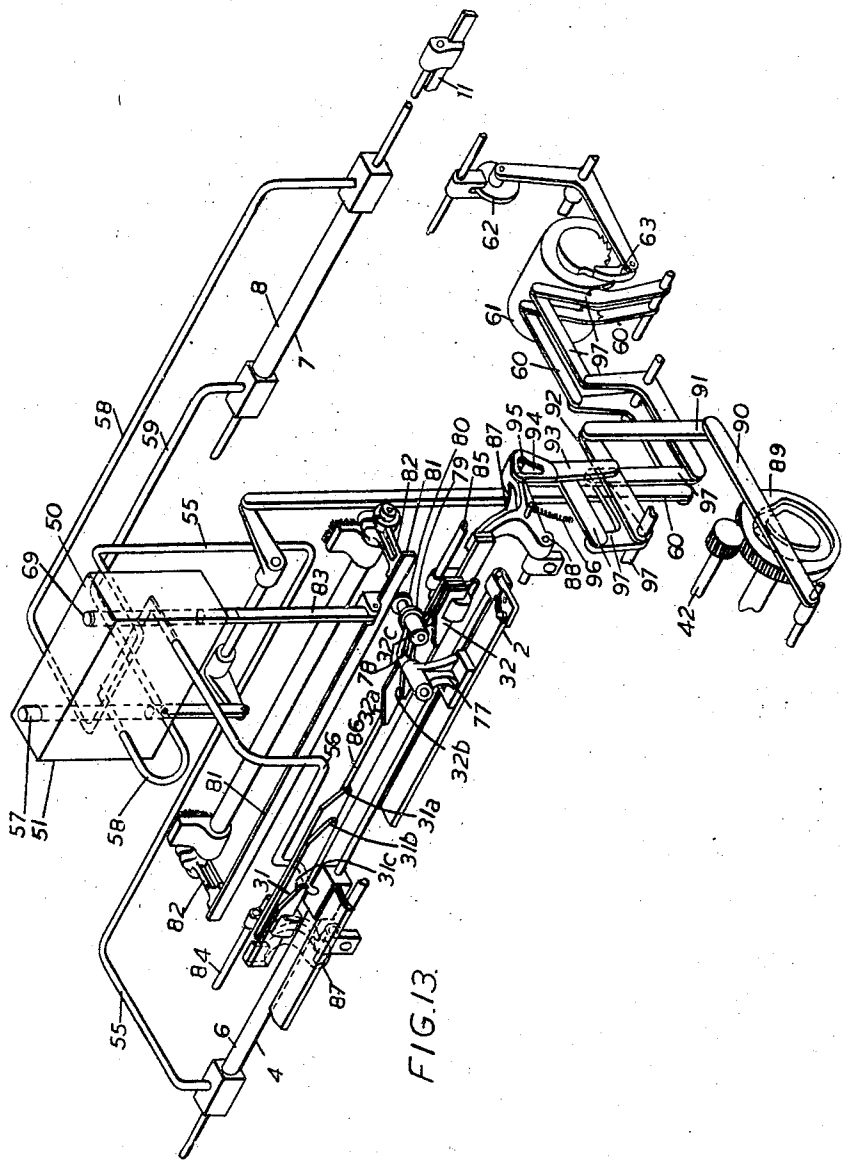


FIG. 13.

Inventor
Samuel Arthur Monk
By
Melvill & Johnson
his Attorney

June 8, 1948. S. A. MONK 2,442,822

KNITTING MACHINE

Filed Aug. 1, 1945 8 Sheets-Sheet 7

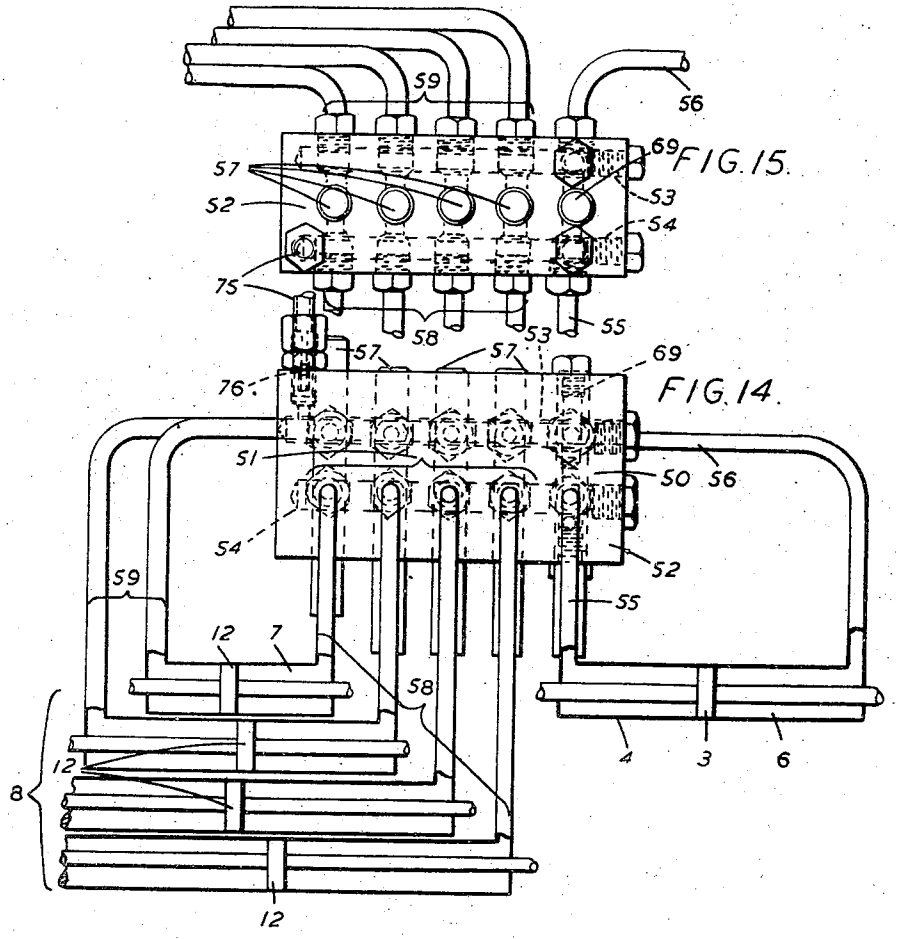


FIG. 15.

FIG. 14.

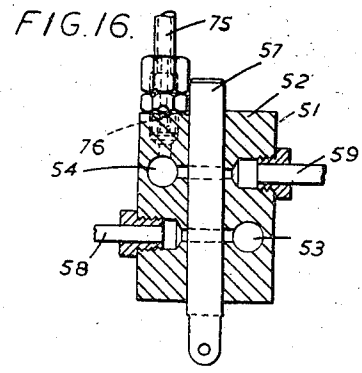


FIG. 16.

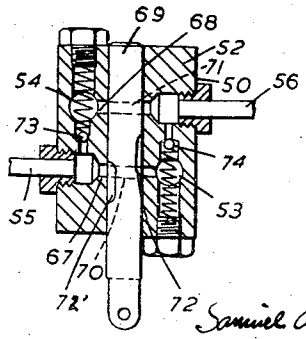


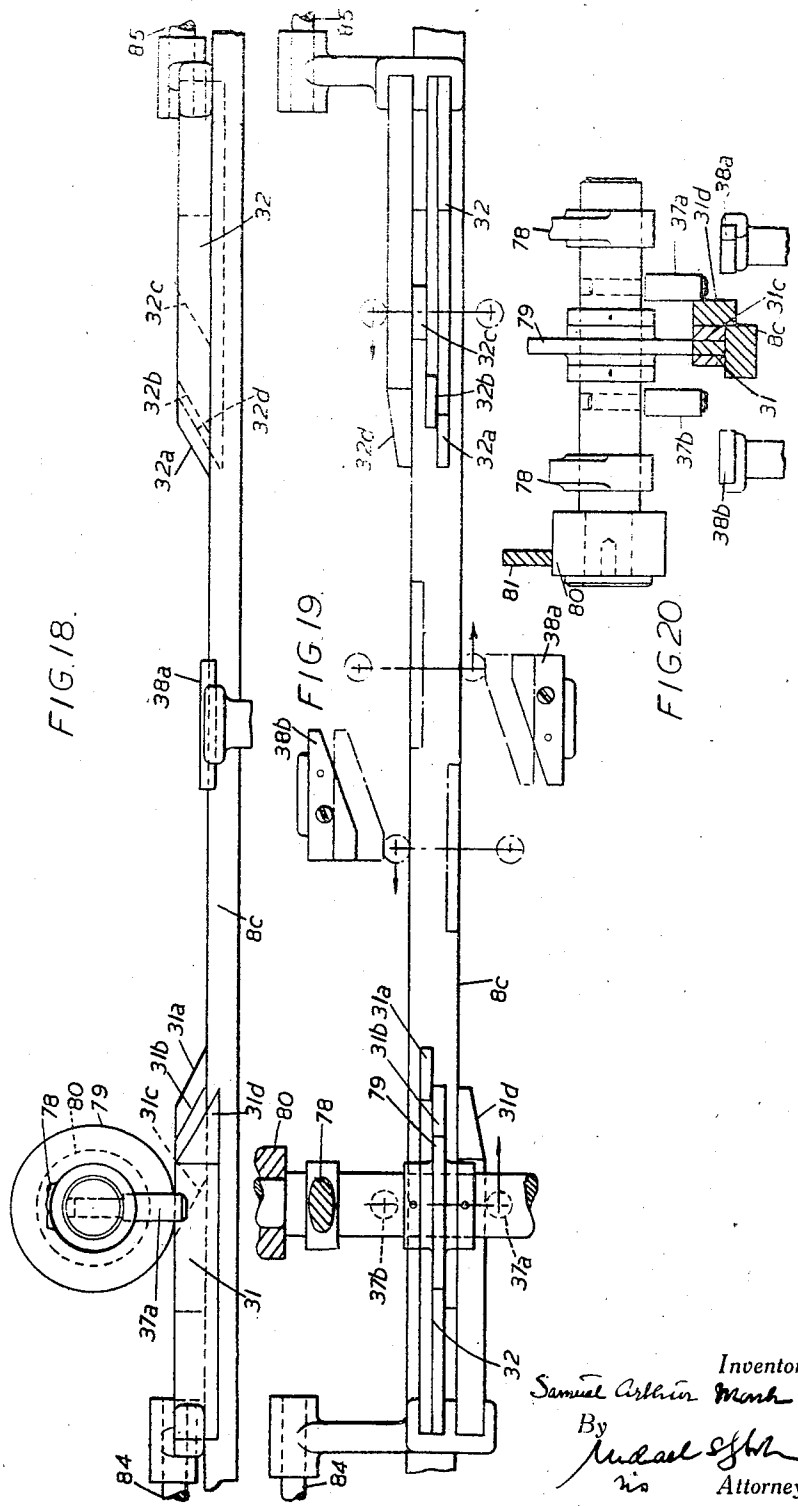
FIG. 17.

Inventor
Samuel Arthur Monk
By Michael O'Shea
his Attorney

June 8, 1948. S. A. MONK 2,442,822

KNITTING MACHINE

Filed Aug. 1, 1945 8 Sheets-Sheet 8



Inventor
Samuel Arthur Monk
By
his Attorney

Patented June 8, 1948 2,442,822

UNITED STATES PATENT OFFICE

2,442,822

KNITTING MACHINE

Samuel Arthur Monk, Mansfield, England, assignor of one-half to Mellor Bromley and Company Limited, Leicester, England

Application August 1, 1945, Serial No. 608,171
In Great Britain July 6, 1944

11 Claims. (Cl. 66—82)

1

This invention relates to knitting machines, and is concerned with the application of hydraulic mechanism thereto for reciprocating certain parts. Broadly the invention relates to knitting machines of the type having a member that traverses to and fro along a line of knitting instruments. Primarily the invention relates to straight bar knitting machines of the Cotton's patent type, and is concerned more particularly but not exclusively with hydraulic mechanism for traversing at least one carrier or carrier rod thereof.

As viewed from one aspect the invention provides a knitting machine of the type specified having an hydraulic piston-and-cylinder device for traversing the aforesaid member, a pump for supplying hydraulic fluid thereto, valve mechanism for controlling the hydraulic fluid, and means for varying said valve mechanism to vary the traverse of said members. Where the said member drives or is constituted by a carrier or carrier rod in a Cotton's patent or other straight bar knitting machines having stops for variably determining the length of draw or traverse of said carrier or rod, the said varying means may operate with the stops. The pump may be driven from the coulier or draw mechanism, in which case it is preferably of the double-acting piston-and-cylinder type, or it may be driven from the main cam shaft, or from the hand wheel shaft or from an independent motor.

Viewed from another aspect, the invention provides a knitting machine of the aforesaid type having slurcock driving apparatus comprising a hydraulic piston-and-cylinder device, a pump for supplying hydraulic fluid thereto, and valve mechanism for controlling the flow of fluid between the pump and the device. The invention further includes a Cotton's patent or other straight bar knitting machines, having at least one double-acting hydraulic piston-and-cylinder device for driving a carrier or carrier rod, valve mechanism controlling the hydraulic circuit thereof to vary the length of draw, a double acting hydraulic piston-and-cylinder device for driving a slurcock, and means supplying hydraulic fluid to said devices. The invention still further includes a knitting machine of the type specified, comprising a plurality of hydraulic piston-and-cylinder devices each for traversing at least one member aforesaid (particularly a carrier or rod), a pump for supplying hydraulic fluid thereto, a distributor for connecting said pump to any selected one of said devices and traverse-varying valve means for controlling the flow between

2

the pump and the selected device to vary the traverse of the member driven by that device.

The foregoing and other features of the invention set out in the appended claims are incorporated in the construction that will now be described as examples of the application thereof to a Cotton's patent machine with reference to the accompanying drawings in which:

Figure 1 is a perspective view showing the relevant parts of a Cotton's patent machine incorporating one construction according to the invention;

Figure 2 is a detail of a hydraulic valve, on a larger scale;

Figure 3 is a plan view of cams controlling the hydraulic circuit and

Figures 4 and 5 are cross sections illustrating switching mechanism.

Figure 6 is a perspective view illustrating a further construction, and

Figures 7, 8 and 9 illustrate the action of a valve therein;

Figure 10 is a cross section through a further machine according to this invention, illustrating the application of the invention to driving any selected one of a plurality of carriers;

Figure 11 is a front elevation, and

Figure 12 is a plan of a portion thereof;

Figure 13 is a diagrammatic perspective view of the relevant portions of the mechanism;

Figure 14 shows valve mechanism in elevation, and

Figure 15 is a plan thereof;

Figures 16 and 17 are cross-sections showing details of said mechanism.

Figures 18, 19 and 20 are respectively an elevation, a plan, and section of certain details that may be incorporated.

In the construction illustrated in Figure 1 the coulier mechanism 1 (connected to the slurcock tie bar or like reciprocating part 2) reciprocates horizontally the piston 3 of a double-acting piston-and-cylinder pump 4 having the piston rod 5 projecting at each end of the stationary cylinder 6 through a gland. This pump 4 is connected by pipes to each end of the cylinder 7 of a second double-acting piston-and-cylinder device 8 (referred to as the carrier unit) the piston rod 9 of which projects horizontally at each end of the cylinder 7 through a gland, and is connected to the main carrier drive 10 and thence to the selected carrier rod 11.

Two valves are provided, respectively controlling the hydraulic flow to and from the ends of the second cylinder 7 and the by-pass of oil or

other hydraulic fluid between the opposite ends of the pump cylinder 6, so that the coulier mechanism 1 reciprocates the pump piston 3 with a constant amplitude, the second piston 12 and carrier rod 11 are traversed. The two valves are of similar construction but for convenience are given the references 13 and 14. As shown in Fig. 2, each consists of a body 15 having three ports 16, 17, 18, and enclosing a semi-rotary valve member 19 cut with a three legged passage 20 whereby as the member 19 is rocked from one to the other of its two alternative positions one or other of the ports 16, 17 is closed and the other placed in communication with port 18. This figure is to be considered as showing valve 13 in the by-pass position and valve 14 in the coupling-driving position. Pipe 21 leads from the left hand end of the pump cylinder 6 to port 18 of the left hand valve 13 and pipe 22 from port 16 of the latter to the right hand end of the second cylinder 7 while pipe 23 leads from the left hand end of the latter to port 17 of valve 14 and pipe 24 from port 18 of the latter to the right-hand end of pump cylinder 6. Pipe 25 leads between port 16 of valve 14 and the left hand end of the pump cylinder 6 and pipe 26 between port 17 of valve 13 and the right hand end of the pump cylinder. The valves 13 and 14 are respectively operated, each through a lever 27 or 29 and truck 28 or 30, by two spaced cam devices 31, 32 on the tie bar or other part 2 reciprocated with the pump piston 3.

The operation of the arrangement will now be described, assuming that both pistons 3 and 12 are at mid-stroke moving from right to left, and the valve levers 27, 29 are off the cams, 31, 32 (i. e. valve 13 has been rotated clock-wise from the position shown in Fig. 2 to open port 16 and to close port 17, and valve 14 is in the position shown). The pump, piston 3 cannot force oil through pipe 25 because port 16 of valve 14 is closed but oil can pass through pipe 21 to valve 13. Oil cannot pass through pipe 26 because port 17 of valve 13 is closed, but it can pass through port 16 of the latter and pipe 22 to the right hand end of the second cylinder 7 so that the piston 12 of the carrier unit is driven to the left. The oil displaced from the left hand end of the carrier unit flows by pipe 23 to port 17 of valve 14; port 16 of the latter is closed and port 18 is open so that the oil enters the right hand end of the pump cylinder 6 through pipe 24.

Cam 32 eventually raises the lever 29 of valve 14 and gradually closes port 17 (and gradually opens port 16) so that the displaced oil from the carrier unit can no longer pass through valve 14 so that the piston 12 of the carrier unit is gradually brought to a standstill. As the pump piston 3 is still moving to the left, the oil displaced by it is by-passed through pipe 25 and port 16 of valve 14 and thence by port 18 and pipe 24 to the right hand end of the pump cylinder 6.

The pump piston 3 and tie bar 2 reach the left hand end of the stroke with cam 32 still under the lever 29 of valve 14.

The tie bar 2 and the pump piston 3 then start to move to the right. Oil cannot pass through pipes 26 and 22 to the right hand end of the carrier unit because port 17 of valve 13 is closed but is by-passed (by way of pipe 24, valve 14 and pipe 25) to the left hand end of the pump cylinder. As cam 32 moves from under the lever 29 of valve 14, port 16 is gradually closed and port 17 gradually opened so that the by-pass (pipes 24 and 25) is gradually closed and oil flows in gradually increasing volume from valve 14 from pipe 23 to the left hand end of the carrier unit to drive the piston 12 thereof to the right.

Oil from the right hand end of the carrier unit flows along pipe 22 to valve 13, port 17 of which is closed and ports 16 and 18 open, so that the oil flows along pipe 21 to the left hand end of the pump cylinder 6. Both pistons 3 and 12 are now at mid stroke, and for the remaining half of the cycle the reverse of the above takes place with cam 31 operating valve 13.

In order to vary the stroke of the carrier unit the two valves 13, 14 are adjustable towards and away from one another by a screw or screws racked with the carrier stop screw or screws. In the construction illustrated, the valves 13, 14 are carried by the stop boxes 33, 34 adjustable by a right and left hand screw 35 racked in known manner by racking mechanism indicated generally at 36.

As is known, in Cotton's patent and other straight bar knitting machines wherein sinkers are progressively advanced by a slurcock, the carrier is given a lead over the slurcock. That is to say, the carrier commences a movement at an earlier point in the travel of the slurcock than that, in the previous slurcock travel, it came to rest. A mechanism for producing this lead is shown in Figs. 3—5 in the cam device 32 for value 14, it being understood that a similar mechanism is also provided in the cam device 31 for valve 13.

The cam device 32 has two offset cams or ramps 32*a*, 32*b* spaced apart by an amount L which provides the lead, the truck 30 travelling up selvedge cam 32*a* at the end of one draw and down setting-in cam 32*b* at the beginning of the next draw. In order to change the truck over from one cam to the other, the truck is slidable axially with respect to the valve lever 29 and is provided with a follower 37 for producing this movement. After the truck 30 has ascended selvedge cam 32*a* the continued movement to the left (Fig. 3) of the device 32 brings a side ram 32*d* against the follower 37 to displace the truck into line with setting-in cam 32*b* ready to descend the latter in the next draw. If in the cam device 31 the selvedge cam thereof is aligned with the said setting-in cam 32*b* and the setting-in cam thereof is aligned with the said selvedge cam 32*a* the truck may remain in the same position and will engage the selvedge cam of device 31 being then switched over into the track of the setting in cam of device 31 by a switch ramp which is inclined in the reverse direction to switch ramp 32*d*. If however, the two setting in cams and the two selvedge cams are aligned, it is necessary to switch the truck 32, at an immediate stage in each draw, out of the track of the setting in cam that it has just descended and into the track of the selvedge cam that will shortly ascend. The intermediate switch device for producing this movement is shown at the left hand end of Fig. 3 and in Fig. 5. It consists of a cam 38 having its flanks disposed to engage follower 37 and to shift the truck 30 from the track of the setting in cams into the track of the selvedge cams.

The splicing and heeling carriers may each have a complete hydraulic drive system of their own as just described. For normal splicing, the valves are fitted one on each main rack screw and one on the splicing rack screw, but for plated splicing plating cams on the tie bars are used thereby giving a later movement to the carrier

with constant lead at full speed. For the heeling carrier, a slow draw may be produced by having a large diameter piston and cylinder.

In a further construction, a rotary or like pump is employed, such as is indicated at 6' in Fig. 6, supplying oil to a carrier unit through adjustable valves as before described. For example there may be one such arrangement for the main carrier drive, another for the splicing carrier drive, and a third for the heel and toe carrier drive. In such arrangement, or in the arrangement illustrated in Fig. 1 instead of driving the slurcocks 2a from a conventional coulier mechanism, they may be driven by a hydraulic double-acting, piston and cylinder device 8 supplied with oil by a rotary or like pump 6' through pipe 43 and valve 39 which admits oil by pipes 44, 45 alternatively to either end and simultaneously opens the other end by way of pipe 46 to a tank or sump 40 from which the pump 6' draws its supply through pipe 47. Since the slurcocks do not require a variable draw, the valve 39 is controlled by a cam 41 rotating at half the speed of the main cam shaft 42, a position being provided at each end of the draw wherein the said device 8 is by-passed and the pump 6' delivers direct to the sump 40. The valve 39 incorporates a semi-rotary cock member 48. Fig. 7 shows its position when the piston 12 of device 8 and the slurcock 2a are being driven to the left. Fig. 8 shows the position when the device 8 is by-passed, the slurcock 2a is stationary, and the pump 6' delivers straight to the sump 40. Fig. 9 shows the position when the piston 12 and slurcock 2a are being driven to the right.

The rotary pump or pumps 6' may be connected to the hand wheel shaft 49 of the machine.

In Figs. 10–17 there is shown a more elaborate arrangement providing for the selection of any one of a number of carriers.

The tie bar or like part 2 reciprocated by the coulier mechanism is connected to a double acting piston 3 working in a fixed hydraulic cylinder 6 constituting the pump 4 aforesaid. The opposite ends of this pump cylinder 6 are connected by way of a traverse varying valve 50 and a distributor 51 to the ends of a plurality of stationary hydraulic piston-and-cylinder devices 8 comprising cylinders 7 each containing a double acting piston 12 connected to a carrier rod 11 movable between adjustable end stops as before described. Thus, the pump 4 being connected to any selected carrier-driving cylinder as the pump piston moves to and fro the piston of that carrier-driving cylinder moves with it, but the travel of the last mentioned piston is varied by the traverse varying valve 50 in a manner hereinafter described, said valve operating to establish a connection between opposite ends of the pump cylinder 6, which by-passes the distributor 51 and the selected carrier driving piston.

The distributor 51 comprises a valve block 52 having two manifolds 53, 54 (see particularly Figs. 16 and 17) connected respectively by pipes 55, 56 to the ends of the pump cylinder by way of the traverse-varying valve 50, and in this block 52 there are a number of plunger valves 57, one for each carrier driving cylinder 7, each of which is movable between a lowered cut off position and a raised operative position (Fig. 16) in which the two manifolds 53, 54 are respectively connected to the ends of the associated carrier-driving cylinder by pipes 58, 59. Each plunger valve 57, is moved through suitable connections 60 from a row of studs or the like on a patterning device 61

which is racked at appropriate intervals to change the selection; the racking may be effected by shogging a racking truck 62 (operating a racking pawl or clawker 63) into register with a racking cam, and the patterning device may be a drum. Such mechanism is well understood in the art and requires no further illustration than that provided in Fig. 13 (wherein the connections 60 for moving a representative plunger 57 are shown).

In addition at least three of the plunger valves are under the control of the known 3-carrier selecting device. This latter device, when rendering operative, selects three carriers in alternation each to make a single draw and is employed in making "ringless" hosiery. This device is indicated generally at 64 in Figs. 10 and 12 and comprises cams 65 which, when racked by means 66 move the plungers 57 for these three carriers.

The traverse-varying valve 50 is also incorporated in the aforesaid valve block 52. It comprises a conduit 67 for connecting an inlet pipe 55 from the left hand end of the pump cylinder 6 to that manifold 53 which is arranged for connection by pipes 58 to the right hand ends of the carrier driving cylinders, a conduit 68 for connecting an inlet 59 from the right hand end of the pump cylinder to that manifold 54 which is arranged for connection by pipes 59 to the left hand end of the carrier driving cylinders; and a valve plunger 69 movable between a lower operative position (Fig. 17) in which said conduits 67, 68 are aligned with ports 70, 71 in the plunger and an upper-cut off position in which the conduits are interrupted and a by-pass is established between said two inlet pipes 55, 56 by way of plunger grooves 72, 72' and port 70. In this position the hydraulic fluid flows through the by-pass from one end of the driving cylinder 6 to the other and is not transmitted to the selected carrier-driving cylinder. It therefore follows that the timing of the operation of this valve plunger determines the traverse of the selected carrier rod.

It may here be mentioned that it is convenient to provide a spring-loaded ball or other non-return valve 73, 74 of restricted capacity permitting a throttled hydraulic flow, under exceptional pressure conditions from the right hand inlet pipe 56 to the left hand manifold 53 and from the left hand inlet pipe 55 to the right hand manifold 54.

The hydraulic system may be kept full of fluid by a connection 75 leading from a reservoir (not shown) to the manifold 54 by way of a spring-loaded non-return valve 76.

The valve plunger 69 of the traverse varying valve 50 is operated in the following manner. The tie bar 2 carries a bracket 77 supporting a small truck lever 78 having two trucks 79, 80. Truck 79 co-operates with two cam devices 31, 32 spaced apart in the direction of the length of the draw, so that at a predetermined stage in the travel of the tie bar 2 said truck 79 runs onto one of said devices and the lever 78 is raised. In this movement the other truck 80 raises a horizontal bar 81 which is supported on levers 82 and is connected by link 83 to the valve plunger 69, which latter is thus raised to terminate the travel of the selected carrier rod, the first truck 79 thereafter travelling on top of the operative cam device. In the reverse movement of the tie bar 2 the truck 79 eventually runs down said cam device so that the valve plunger 69 descends to the operative position (Fig. 17) and the carrier rod starts to move in the reverse direction and

subsequently runs up the other cam device to raise the plunger to the cut-off position and to bring the carrier rod to a standstill. Therefore the location of these cam devices 31, 32 in the length of the travel of the tie bar 2 determines the points in the draw at which the selected carrier rod commences and terminates its movement and they are connected by means 34, 85 to the carrier stops so as to be adjustable therewith, the valve plunger cutting off the flow to the selected carrier-driving cylinder at the moment that the associated carrier rod strikes its stop.

It will be appreciated however, that the selected carrier must have a lead over the slurcock 2*a*, and that the carrier-driving piston must start its travel at an earlier point in the travel of the slurcock and tie bar from that at which it came to a standstill. For this purpose each cam device 31, 32 comprises two cams: a selvedge cam 31*a* or 32*a* up which the truck 79 runs to terminate the carrier traverse and a setting in cam 31*b* or 32*b* down which it runs to start the carrier traverse, and the setting in cam is spaced outwards of the selvedge cam to an extent depending on the required lead. In order to ensure that the truck runs up a selvedge cam at the end of each carrier traverse and down a setting in cam at the beginning of each traverse a change over apparatus is provided for effecting a relative lateral displacement of the truck and cam devices. This apparatus may operate by moving the cam devices or the truck; it may derive its movement from a suitable rotary cam stepped disc, or the like, or, if the truck is displaceable, it may consist of guides which deflect the truck into the appropriate path.

Two arrangements of these cams is possible. In one, the two selvedge cams are aligned and the two setting-in cams are aligned. This involves a changeover at the end of each traverse and midway in each traverse and a simple arrangement of this nature is illustrated in Figs. 3–5. In the other each selvedge cam is aligned with a setting in cam and since the truck, having travelled down a setting-in cam will, by continuing in the same path eventually arrive at the aligned selvedge cam this only involves changing-over from a selvedge cam to a setting in cam at the end of each traverse. A construction of this nature is hereinafter described with reference to Figs. 18–20.

It is further desirable when the use of a given carrier is discontinued for that carrier to be run out to a rest or "home" position beyond the end of the division of needles, and when a new carrier is required for the new carrier to be brought in from that extreme rest position. This involves the provision of means whereby any selected carrier rod 11 and its driving piston 12 may be given an additional travel to bring the associated carrier into or from the rest position. For this purpose two "home" cams 31*c* and 32*c* are provided for operating on the truck 79 which cams are suitably widely spaced apart beyond the other cams and are not adjustable with the aforesaid selvedge and setting-in cams, means being incorporated in the change-over apparatus for producing such additional movement between the cams and truck as will bring the latter out of co-operation with the selvedge and setting in cam at one end and into co-operation with the home cam. Thus in taking a carrier out of operation, the truck 79 will miss the inoperative selvedge cam and will continue to travel out until lifted by the home cam 31*c* or 32*c* to terminate the carrier travel in the rest position, and in the rest position and in bringing a carrier into operation the truck travels down the home cam at an early stage in the draw and starts the carrier moving in from its rest position.

In order to permit a carrier to travel out to its rest position, the appropriate carrier stops such as that illustrated at 33' and 34' in Fig. 1 is raised (on the adjustable stop head carrying it) either manually or automatically through a stud or the like on the aforesaid patterning device, and when the newly selected carrier is to travel in from its rest position the associated stop is lowered by said patterning device but, being spring loaded, is temporarily lifted by the co-operating stop member on the carrier rod (through the medium of suitable bevel faces) and then drops down behind said stop member.

In the example illustrated in Figs. 10–13 the cam devices 31, 32 are movable laterally by change over apparatus.

For this purpose they are carried by a bar 86 supported on levers 87 pivoted at 88 so that the bar may be moved laterally. While any given carrier remains in operation the lateral movements are such as to bring the selvedge and setting in cams alternatively into the track of truck 79, and these movements are derived from cam 89 which is driven from the main cam shaft 42 and operated through truck lever 90, link 91, lever 92 and a slotted link 93, which at its upper end has a slot 94 in which a pin 95 on one of the levers 87 engages. This pin normally occupies the position in the slot shown in Fig. 13 and so as the truck lever 90 moves the link 93 (being in direct connection with the lever 87) effects the required change between the selvedge and setting in cams. When however, it is desired to effect a change in the carrier selection the bar 86 must be given an additional rearward movement such as will bring home cams 31*c* and 32*c* into the track of the truck 79. To do so the link 93 is pushed to the right Fig. 13 so that the pin 95 is brought to the enlarged part of the slot 94 whereupon a spring 96 effects the required movement of the bar 86. The carrier hitherto in use thereupon travels out to its home position and is brought to a standstill in that position by the truck 79 ascending the home cam 31*c* or 32*c*. The carrier change is effected by the distributor 51 and at the beginning of the next draw the truck travels down the home cam and the new carrier moves inwards from the home position but at an intermediate stage in the draw the bar 86 is rocked forward from its extreme position to one of its normal positions. To do so the slotted link 93 is pulled forward so that the pin 95 is forced into that normal position in which it is shown in Fig. 13. The movements of the link 93 are derived from the drum or other patterning device 61 through the connections indicated generally at 97.

In the control mechanism for selvedge, setting-in and home cams shown in Figs. 18–20 the bar 86 is stationary and the truck 79 is movable axially on lever 78 by followers 37*a* and 37*b* and each selvedge cam 31*a* and 32*a* is aligned with a setting in cam 31*b*, 32*b*. In order to shift the truck 79 from a selvedge cam to a setting in cam at the end of each draw, the cam devices 31, 32 have side ramps 31*a*, 32*a* which engage the followers 37*a*, 37*b*. For homing, two intermediate switch cams 38*a*, 38*b* are provided which are movable by control such as drum 61 from the full line to the dotted line positions, Fig. 19, and act on followers 37*a*, 37*b*. For example, if it is desired to home a carrier at the end of a draw

from left to right and to introduce a new carrier for the next draw to the left, the intermediate cam 38 is closed in during the draw to the right and shifts the truck 79 into the track of home cam 32c, and in the draw (of the new carrier) to the left cam 38b shifts the truck from the track of the home cam 32c into that of the selvedge cam 31a and the intermediate cam 38a returns to its normal position. Similar operations take place if the home position of the carriers is at the left hand end.

In certain cases, as for example, in splicing and plating it is necessary to employ two carriers. The additional carrier may be driven from the selected carrier rod through mechanical connections designed to ensure the correct lead and travel, or it may be driven by its own piston-and-cylinder device. In this latter arrangement, the said device for the additional carrier (or for each of them) may be driven from an additional pump cylinder, or it may be driven from the aforesaid pump cylinder if the latter is of sufficient capacity and suitable valve mechanism is incorporated. Conveniently, the carrier driving devices 8 and the valves are located close to the carriers or carrier rods, while the pump is or pumps are located in the lower part of the machine.

I claim:

1. A knitting machine of the type incorporating a line of knitting instruments and a member that traverses to and fro along it; having an hydraulic piston-and-cylinder device for traversing the aforesaid member, a pump for supplying hydraulic fluid to said device, two valves controlling inlet to and exhaust from the cylinder of said device at both sides of its piston and for thereby controlling the direction and length of stroke thereof, cam means travelling to-and-fro for operating said valves, and means for adjusting the position of said valves to adjust the length of stroke.

2. A machine according to claim 1, having a coulier or draw mechanism for driving the cam means with a constant amplitude.

3. A knitting machine of the type incorporating a line of knitting instruments and a member that traverses to and fro along it; comprising a plurality of hydraulic piston-and-cylinder devices each for traversing at least one member aforesaid, a pump for supplying hydraulic fluid to said device, a distributor for connecting said pump to any selected one of said devices, and traverse-varying valve means for controlling the flow between the pump and the selected device to vary the traverse of the member driven by that device.

4. A machine according to claim 3, having the traverse-varying valve means located between the pump and the distributor.

5. A machine according to claim 3, wherein the distributor consists of a plurality of valves associated with the several piston-and-cylinder devices, and having a patterning device for operating them selectively.

6. In a straight bar knitting machine having a line of needles, a member movable along it with a constant amplitude of traverse, and a carrier movable to and fro along it with a variable amplitude of travel; the combination of an hydraulic piston-and-cylinder device for traversing the carrier, a pump for supplying hydraulic fluid to said device, means including valve mechanism controlling the hydraulic fluid, for varying the carrier traverse, and means for giving to the carrier a lead over said member by control of said device.

7. A machine according to claim 3, being a straight bar knitting machine wherein the said member driven by each device is a carrier, said devices are located close to the carriers, the pump is located in the lower part of the machine, and the valve means is interposed between said devices and the pump.

8. In a straight bar knitting machine having a line of needles and a carrier movable therealong with a variable amplitude of traverse and also movable to and from a home position; the combination of a hydraulic piston-and-cylinder device for driving the carrier, a pump for supplying hydraulic fluid to said device, traverse-varying valve means for controlling the flow between said pump and device to vary the amplitude of traverse of the carrier, and means controlling said valve means for causing said device to shift the carrier into and out of its home position.

9. A machine according to claim 6, wherein the said means comprises a selvedge cam for terminating the carrier traverse, a setting-in cam for initiating it, which cams are spaced apart by an amount determining the lead and are offset, a valve operating cam follower for engaging said cams, and change-over means for producing relative movement between said cams and follower to cause the latter to engage the selvedge cam at the termination of a traverse and the setting-in cam at the beginning thereof.

10. A machine according to claim 6 having homing means for bringing a carrier to and from a home position.

11. A machine according to claim 6, having homing means for bringing a carrier to and from a home position, which homing means comprises an offset home cam and the change-over means is arranged to cause the follower to miss the selvedge and setting-in cams and to engage the home cam.

SAMUEL ARTHUR MONK.

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