

(No Model.)

7 Sheets—Sheet 1.

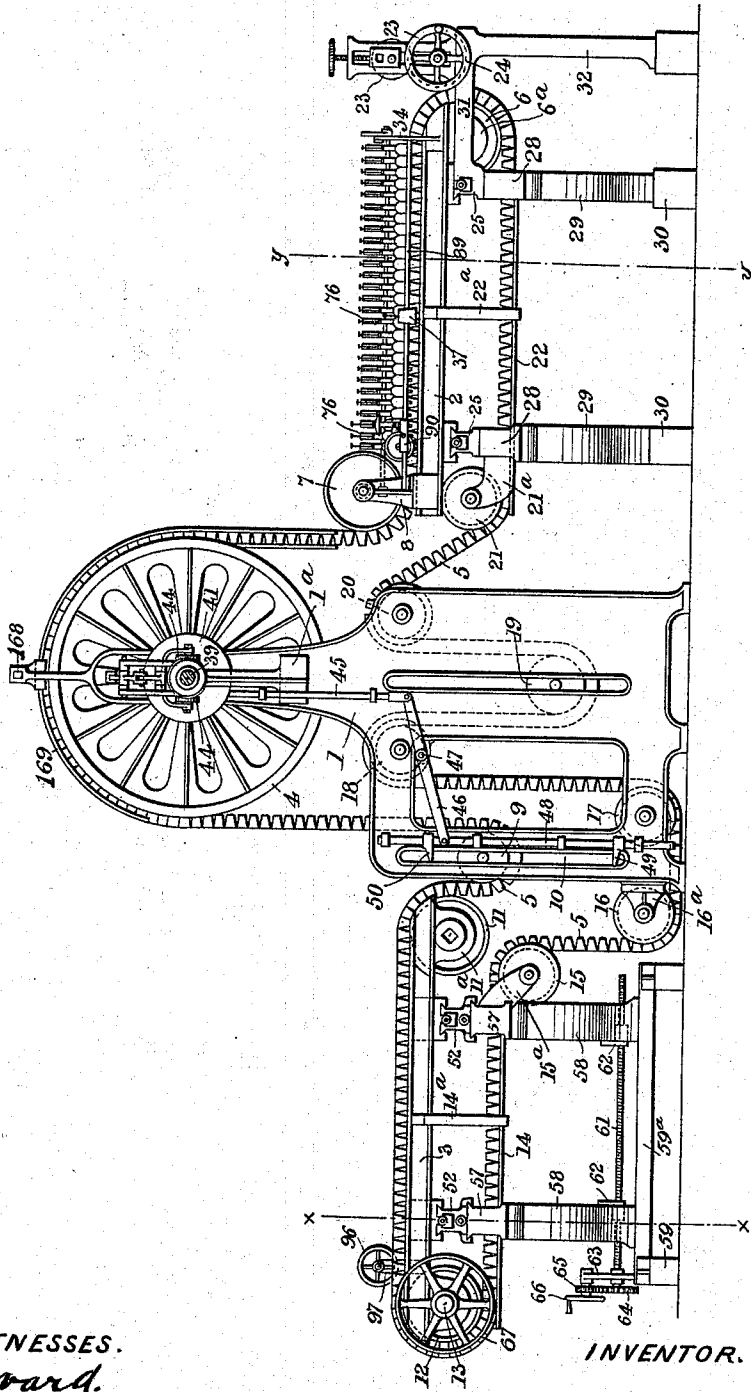
W. WESTWELL.

STRETCHING APPARATUS FOR CALICO BLOCK PRINTING MACHINES.

No. 530,373.

Patented Dec. 4, 1894.

Fig. 1.



WITNESSES.
J. B. Howard.
Charles Ainley

INVENTOR.
William Westwell.

(No Model.)

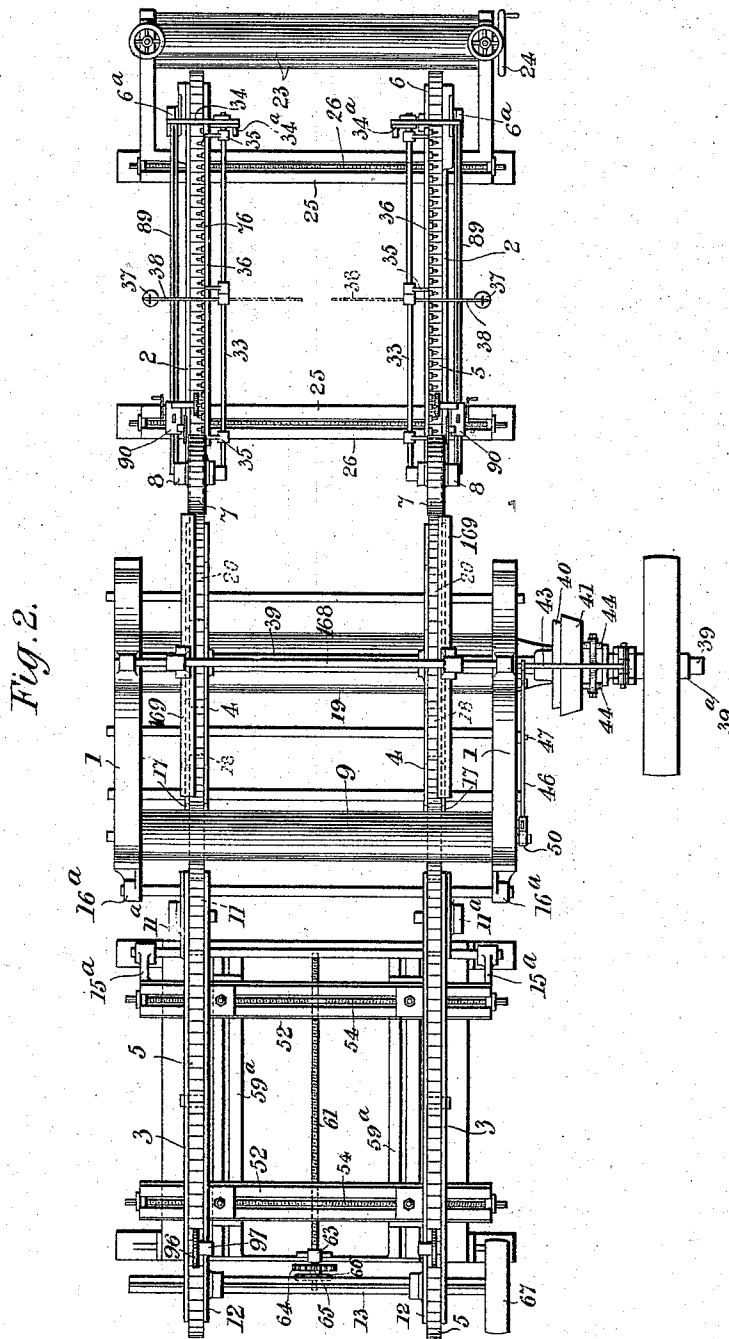
7 Sheets—Sheet 2.

W. WESTWELL.

STRETCHING APPARATUS FOR CALICO BLOCK PRINTING MACHINES.

No. 530,373.

Patented Dec. 4, 1894.



WITNESSES.

WITNESSES.
B. Howard
Charles Ainley

INVENTOR.

William Westwell

(No Model.)

7 Sheets—Sheet 3.

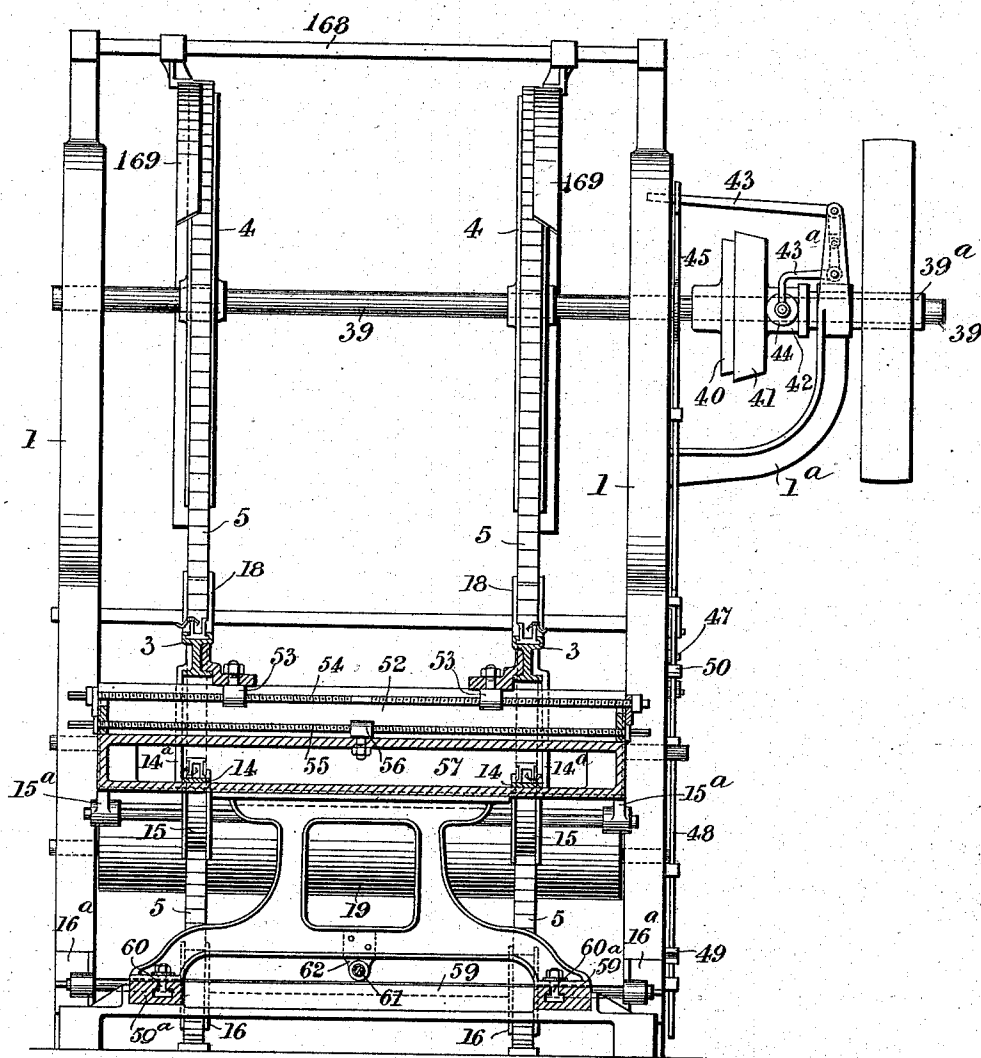
W. WESTWELL.

STRETCHING APPARATUS FOR CALICO BLOCK PRINTING MACHINES.

No. 530,373.

Patented Dec. 4, 1894.

Fig. 3.



WITNESSES.
J. B. Howard
Charles Ainley

INVENTOR.
William Westwell.

(No Model.)

7 Sheets—Sheet 4.

W. WESTWELL.

STRETCHING APPARATUS FOR CALICO BLOCK PRINTING MACHINES.

No. 530,373.

Patented Dec. 4, 1894.

Fig. 4.

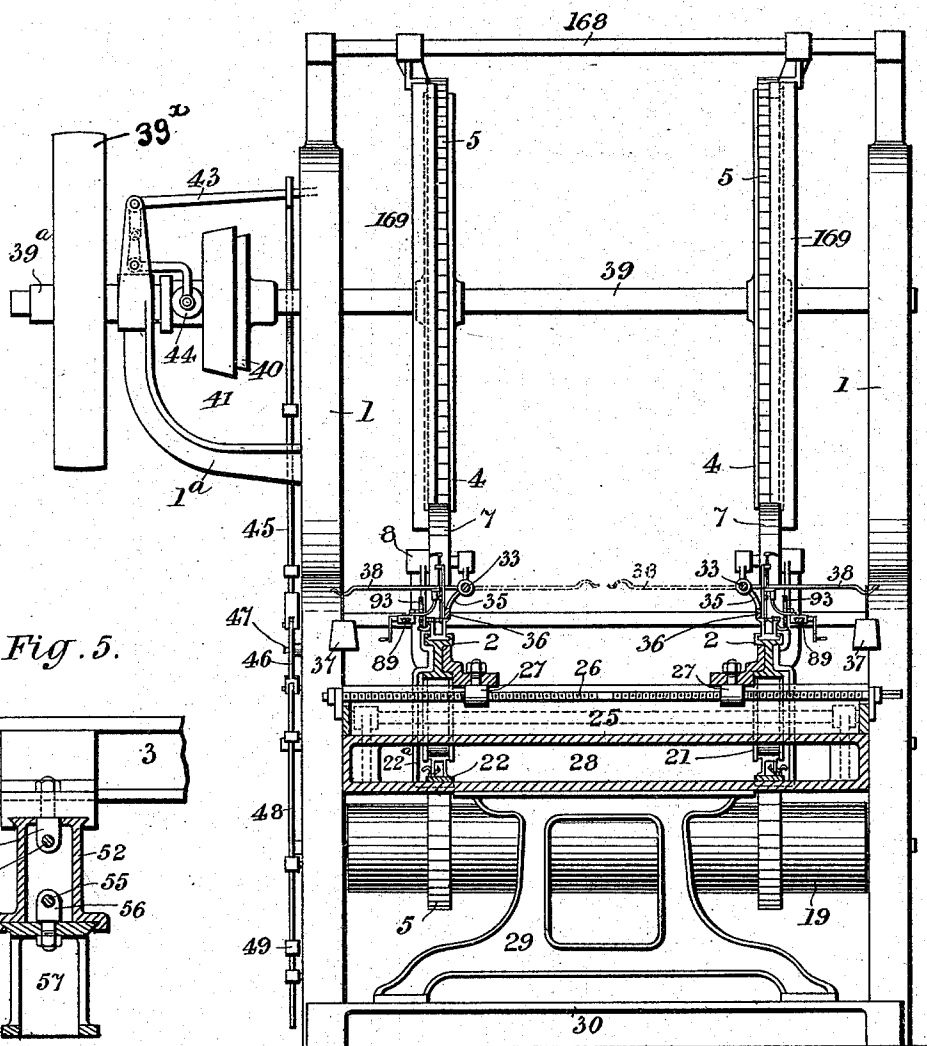
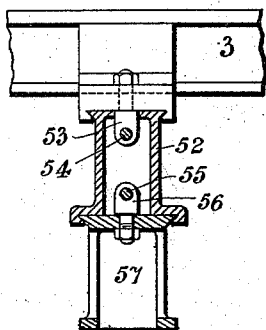


Fig. 5.



WITNESSES.

J. B. Howard
Charles Ainley

INVENTOR.

William Westwell.

(No Model.)

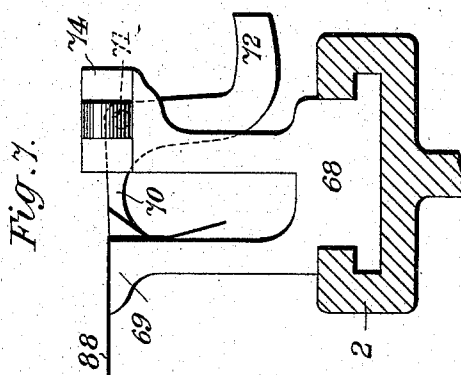
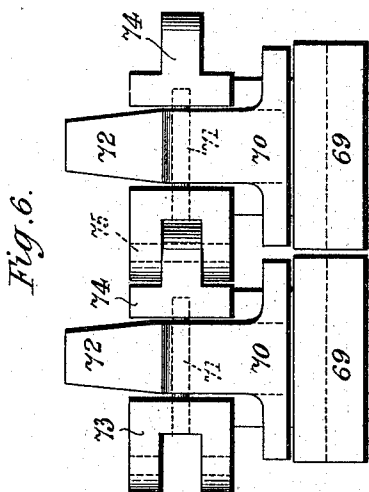
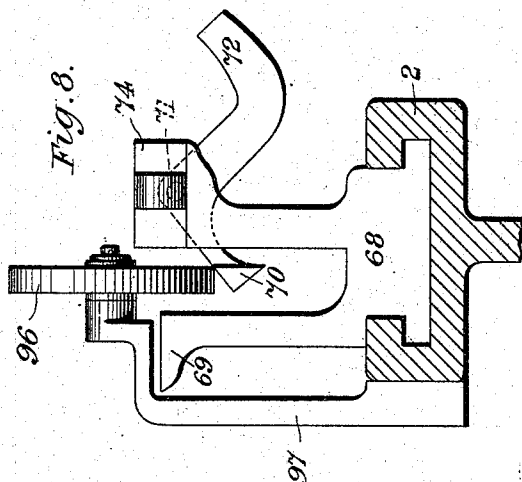
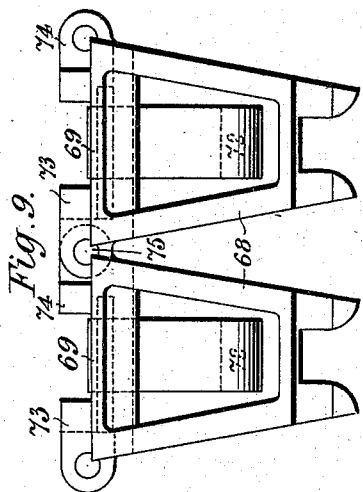
7 Sheets—Sheet 5.

W. WESTWELL.

STRETCHING APPARATUS FOR CALICO BLOCK PRINTING MACHINES.

No. 530,373.

Patented Dec. 4, 1894.



WITNESSES.

Edward
Charles Ainley

INVENTOR.

William Westwell.

W. WESTWELL.

STRETCHING APPARATUS FOR CALICO BLOCK PRINTING MACHINES.

No. 530,373.

Patented Dec. 4, 1894.

Fig. 10.

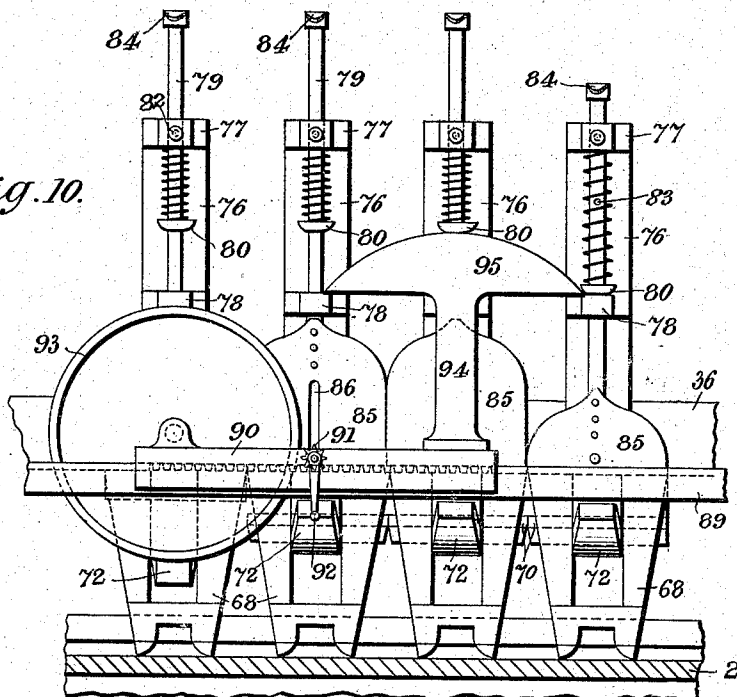
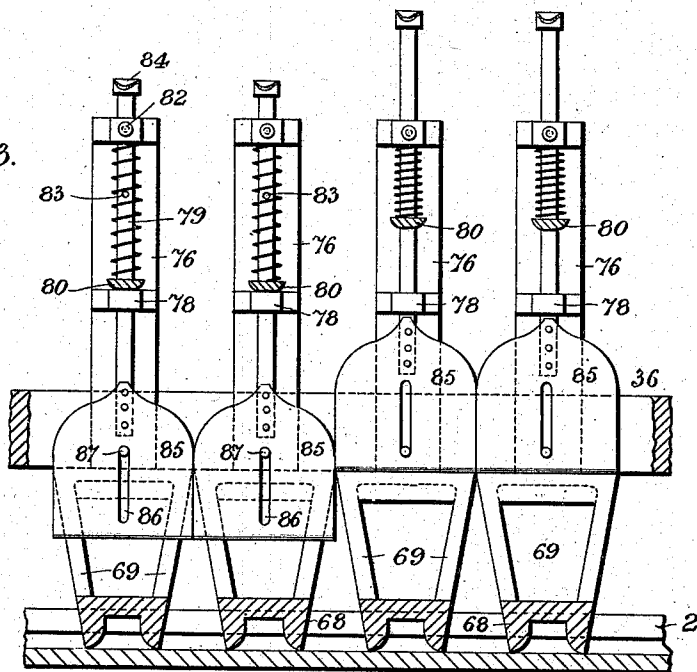


Fig. 13.



WITNESSES.

W. Howard
Charles Ainley

INVENTOR.

William Westwell

(No Model.)

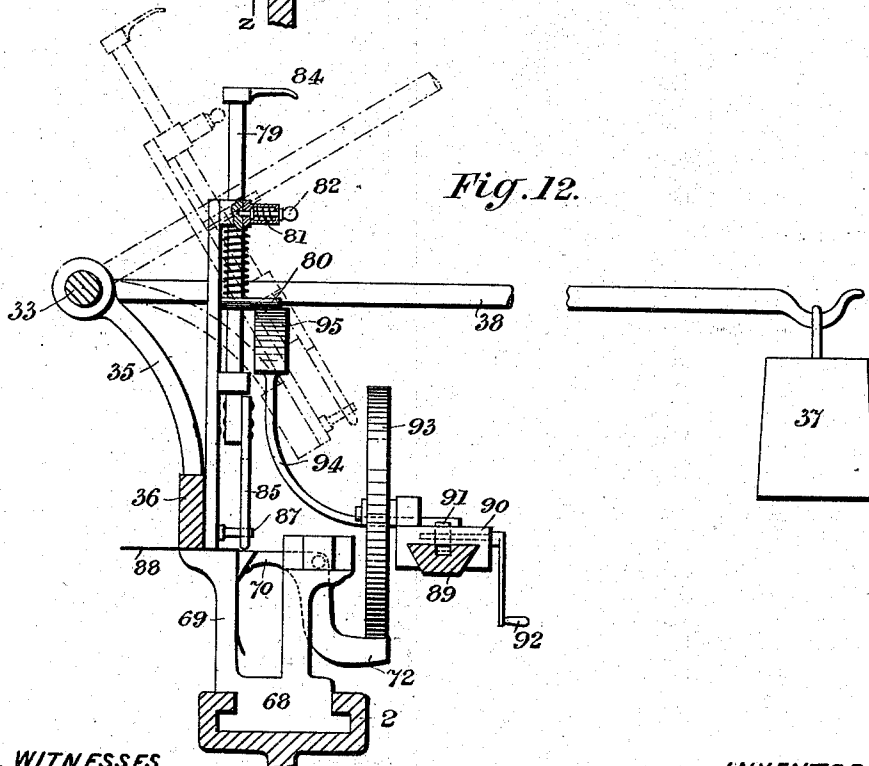
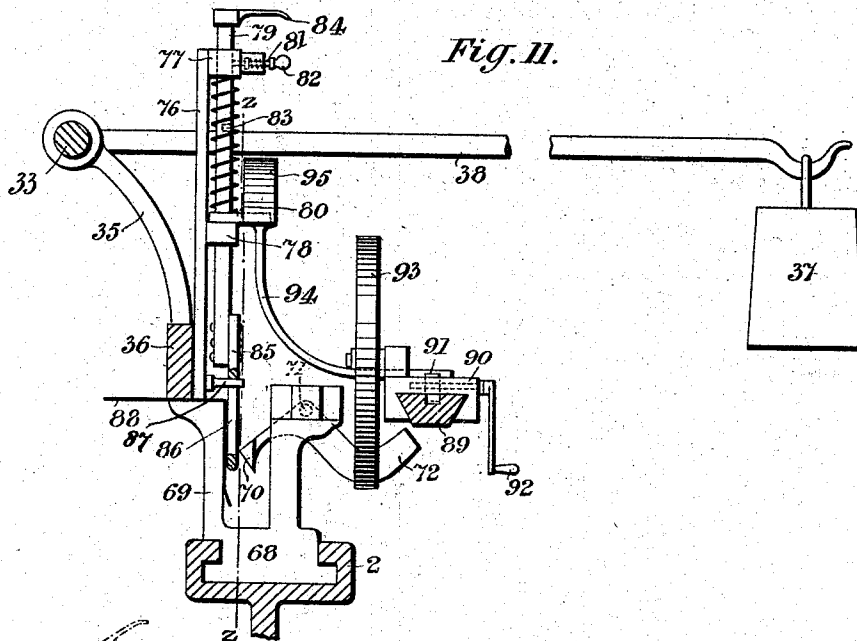
7 Sheets—Sheet 7.

W. WESTWELL.

STRETCHING APPARATUS FOR CALICO-BLOCK PRINTING MACHINES.

No. 530,373.

Patented Dec. 4, 1894.



WITNESSES.

J. E. Howard
Charles Ainley

INVENTOR.

William Westwell

UNITED STATES PATENT OFFICE.

WILLIAM WESTWELL, OF ACCRINGTON, ENGLAND.

STRETCHING APPARATUS FOR CALICO BLOCK PRINTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 530,373, dated December 4, 1894.

Application filed April 3, 1894. Serial No. 506,215. (No model.) Patented in England May 2, 1891, No. 7,633, and November 19, 1892, No. 20,998.

To all whom it may concern:

Be it known that I, WILLIAM WESTWELL, a subject of Her Majesty the Queen of Great Britain, residing at Accrington, in the county of Lancaster, England, have invented a certain new and useful Improvement in Stretching Apparatus for Calico Block Printing Machines, (in part patented to me in Great Britain under date of May 2, 1891, No. 7,633, and under date of November 19, 1892, No. 20,998,) of which the following is a specification.

My invention relates to improvements in apparatus for stretching cloth, the improvements being particularly adapted to a feeding apparatus for calico block printing machines, the object being to feed and deliver to the printing cylinder of such a machine, the material on which the design is to be printed or blocked without creases and in a perfectly smooth condition.

By the employment of a machine constructed according to my invention the material is fed to the printing machine in a smoother and better state for receiving the impression of the printing cylinder and also with greater rapidity and precision than can be obtained by the usual method of drawing the material directly off from a roller, my improved machine preventing the material traveling askew and causing it to be delivered to the printing machine with the warp and weft at perfect right angles to each other and without any effort or pull by the printing cylinders which is apt to derange the accuracy of the printings and overprintings which the material undergoes.

An apparatus constructed according to my invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of same with the main driving pulley removed. Fig. 2 is a plan. Fig. 3 is a cross section on the line *xx* Fig. 1 on an enlarged scale. Fig. 4 is a cross section on the line *yy* Fig. 1 on an enlarged scale. Fig. 5 is a detail on an enlarged scale of a portion of what is hereinafter referred to as the delivering table. Fig. 6 is a plan of two of the links of the endless chain. Fig. 7 is an end elevation of one of the links shown gripping the material together with a portion of the rail on which it travels. Fig.

8 is a similar view with the gripping jaw open. Fig. 9 is a front elevation of Fig. 6. Fig. 10 is an elevation on an enlarged scale of the means for placing the material in the jaws of the endless chain and for closing said jaws. Fig. 11 is a side elevation of same partly in section showing how the material is placed between the jaws. Fig. 12 is a similar view showing the jaws closed on the material, and Fig. 13 is a sectional elevation on the line *zz* Fig. 11 looking to the left.

The apparatus it will be seen consists of a central framework, comprising the side standards 1, 1, and two independent tables the frames of which are marked 2, 2 and 3, 3 which are hereinafter referred to respectively as the fitting and delivery tables. The main shaft of the central frame 1 is provided with pulleys 4 which act as driving pulleys for endless chains 5 passing over same, the surfaces of such pulleys being recessed and toothed to afford a hold for the chain. The course of this chain may be here described by reference to Fig. 1 it being understood that there is a corresponding chain and carrying parts on the other side of the apparatus.

At the entering end of the fitting table is a loose pulley 6 the journals of which are carried in boxes 6^a in the frame 2 said pulley being recessed to hold the chain 5 and to prevent it from slipping off. The chain in its forward travel passes from this pulley over the top of the frame 2 in which is a T-shaped slot to hold same as shown in Figs. 4, 7 and 8 under a recessed pulley 7 supported by a bracket 8 carried by the frame 2 up over the pulley 4 and down under a loose roller 9 which extends across between the two frames 1, 1. The spindle of this roller is carried by long vertical slots 10 in the frames 1 such slots enabling the roller to rise and fall. From this roller the chain passes up onto the delivery table over a recessed pulley 11 the journals of which are carried in boxes 11^a in the frame 3 over the top of the frame which has a slot similar to that in the frame 2 as shown in Fig. 3, round over a recessed pulley 12 carried by and movable on a grooved shaft 13 supported in the ends of the frame 3, along a light recessed supporting bar 14 which is partly carried by a bracket arm 14^a

depending from the frame 3 and partly by securing its ends to two movable under frames which are hereinafter described. From this bar 14 the chain passes over a recessed pulley 15 the shaft of which is carried by a bracket 15^a attached to or forming part of one of the movable under frames and from this pulley 15 the chain passes down beneath a pulley 16 the shaft of which is carried by a bracket 16^a secured to the frame 1. From the pulley 16 the chain passes across under a recessed pulley 17 the shaft of which is carried directly by the frame 1 up over a recessed pulley 18 the shaft of which is also carried by the frame 1 down under a loose roller 19 which extends across between the two frames 1, 1, the spindle of same being carried in long vertical slots in the frames 1, 1, so that the roller is enabled to rise and fall. From this it passes up to a recessed pulley 20 the mounting of which is similar to that of the pulley 18, back again to the fitting table but to the under side of same by passing under a grooved pulley 21 carried by a bracket 21^a secured to an under frame from whence it passes along a light recessed supporting bar 22 partly supported by a bracket arm 22^a and partly by having its ends carried by the under frame before mentioned and by a corresponding one at the delivery end and from this the chain passes again around the pulley 6. In front of this pulley is placed a pair of rollers 23, 23 one of which is provided with a hand wheel 24 these being for the purpose of nipping and drawing off the material and for stretching or shifting it on the fitting table if necessary which can be done by turning the handle backward.

The chain 5 is composed of a series of links 68 shown in Figs. 6 to 9, the base portion 68 being recessed as shown in Figs. 7 and 8 to travel in the T-shaped slots of the frame and having a fixed upright and straight jaw 69 and carrying a movable jaw 70 pivoted on the pin 71 the jaw 70 having a bent tail 72. The portion 68 carries bosses 73, 74, the boss 73 having a jaw therein and the boss 74 a projection which fits into the jaw of the link next in order the two being secured by pin 75. The parts 68 are wedged shaped in front elevation to allow of the links passing around the pulleys. The pin 71 passes through the boss 73 into the projection 74 as shown in Fig. 6 so that said pin is prevented from working loose in the boss 73 when the chain is made up and the projection 74 of the next link is in place.

The frames 2 of the fitting table are carried by two under frames 25, 25 which are slotted like the slide bed of a lathe and are also open inside to receive a right and left handed screw 26 engaging with the nuts 27, 27 which pass through the slots and are bolted or secured to the frames 2, 2, so that by turning the screw the nuts and consequently the frames will be brought nearer to each other or farther apart

as may be desired. These under frames 25 are supported by beams 28, 28 carried by standards 29 affixed directly to the floor or to a base 30 but the one nearest the entering end has cast or formed with it an extension 31 supported by a leg 32 such extension carrying the rollers 23 before described. A main shaft 39 carries the pulleys 4 between the center frames 1, such pulleys being capable of sliding on the shaft and of being keyed in position thereon. The shaft is provided with a clutch consisting of a disk 40 secured to the shaft, the tapered periphery of which makes frictional contact with the tapered interior of the case 41, a sleeve 42 attached to which is capable of sliding on a sleeve 39^a on the shaft 39 but is compelled to turn with the sleeve 39^a. The driving pulley 39^x shown is secured to the sleeve 39^a. The pulley 39^x on the shaft 39 has a more rapid surface speed than the pulley 67 on the shaft 13. The casing 41 and sleeve 42 are slid to and fro along the sleeve 39^a by means of the cranked lever 43 one end of which is pivoted to a crank 43^a which is forked at the other end and carries disks 44 which engage with a reduced portion of the sleeve 42. The cranked levers 43 and 43^a are pivoted to brackets carried by a bracket arm 1^a which supports the end of the main shaft 39. The other end of the lever 43 passes through the end of a vertical bar 45 on the outside of one of the frames 1 supported by guides in which it is capable of sliding. The other end of bar 45 is connected to one end of a lever 46 which is pivoted about midway or at the point 47 to the frame 1 the other end of the lever being pivoted to a vertical bar 48 supported in guides in which it is capable of sliding, said bar carrying tappets 49, 50 which may be fixed at any desired points on same. The bar 48 is raised by the upward movement of the roller 9 (which will be hereinafter described) the spindle of same striking the tappet 50 and lifting the bar. This through the pivoted lever 46 lowers the bar 45 which pulls down the end of the lever 43 which will press inward the end of the cranked lever 43^a carrying the disks 44 and will force the clutch casing 41 onto the disk 42 with the result that the main shaft 39 will be revolved. When the roller 9 falls in its slot and its spindle knocks the tappet 49 the operation will be reversed the lever 43^a opening the friction clutch so that the revolution of the shaft 39 is stopped.

The frames 1, 1, are connected by a rod 168 which carries curved guards 169 which pass over the pulleys 4 to prevent the chains from falling off and cover the tails of the chains such guards being capable of being slid along the rod 168 and secured in position so that they may be moved with and secured over the pulleys 4. The frames 3 of the delivery table are carried by two under frames 52, 52, (Figs. 3 and 5) slotted like the frames 25 the frames 3 being provided with nuts 53, 53 which pass

through the slots said nuts engaging with a right and left handed screw 54 in the frame 52 which operates the nuts and frames 3, 3 in the same manner as the screw 26 does the frames 2, 2. In the frame 52 is also a screw 55 having a thread in one direction only said screw passing through a nut 56 which is bolted to a second under frame 57. The frame 52 has undercut grooves in its walls at the base such grooves embracing the beveled top of the frame 57. By this means it will be seen that upon revolving the screw 55 in one direction or the other, the frame 52 may be moved laterally together with the frames 3 and that without disturbing the position of such frames in relation to each other. Each frame 57 is carried in turn by a standard 58 supported on a base 59, the longitudinal beams 59^a of which are slotted as shown in Figs. 2 and 3 to hold the T heads of bolts 60 which serve to hold the standards 58, 58, in place when their longitudinal position is obtained. This longitudinal movement of the whole of the delivery table must be provided for in order to enable the table to be brought nearer to or farther from the printing machine for the purpose of obtaining the necessary register on the printing cylinder of the material being fed and the lateral movement described above is also valuable for the same purpose. The longitudinal movement is obtained by means of the screwed rod 61 which passes through the nuts 62, 62 on the standards 58, 58. One end of the rod is supported by a bracket 63 and such end carries a pinion 64 with which engages a second pinion 65 which is in turn operated by a hand wheel 66. The shaft 13 at the end of the delivery frame carries a driving pulley 67. Supported by the bracket 8 of the frame 2 at one end and by a bent bar or bracket 34 at the other end is a rod 33 carrying arms 35 connected by a bar 36 adapted to bear on the fixed jaws 69 of the chain links by the pressure of a weight 37 suspended on an arm 38 when in one position but capable of being turned back out of the way as indicated by dotted lines in Figs. 4 and 12 a stop 34^a (Fig. 2) being provided on the bent bar 34 for the purpose of holding said bar 36 in its turned back position. To the bar 36 are secured a number of uprights 76 Figs. 10 to 13 each carrying guide blocks 77, 78 in which is supported a rod 79 capable of sliding therein. The rod carries a tappet 80 between which and the upper guide 77 is a spiral spring surrounding the rod. In the block 77 is a spring controlled pin 81 provided with a button 82 such pin being adapted to engage with a hole or slot 83 in the rod 79 when the latter is in its raised position. The rod 79 carries at its upper end a finger or lifting piece 84 and at its lower end a plate 85 such plate having a slot 86 into which passes a pin 87 secured in the upright 76 such pin and slot acting as a guide for the plate 85. This plate when the rod 79 is down is adapted to pass between the

jaws of the chain for the purpose hereinafter described.

Attached to the bracket 8 and to the bent bar or bracket 34 as shown in Figs. 1 and 2 is a bar 89 of approximately V shape on which moves a block 90 somewhat similar to the slide rest of a lathe. On the bar is formed a rack with which engages a pinion 91 carried by the block said pinion being rotated by means of the handle 92. The block 90 further carries a disk 93 adapted to bear on the tails 72 of the links and it also carries an arm 94 provided with a rounded head 95 adapted to bear on the tappets 80 and thus lift rods 79 and plates 85.

For the purpose of opening the movable jaws of the links I arrange at the end of the delivery table 3 a disk 96 carried by a small bracket 97 the disk being set so that its edge acts upon the top of the jaws 70 as shown in Figs. 1 and 8 as the chain approaches the end of the delivery table and by pressing same down cause the material held between them to be released.

The operation of the machine is as follows:—The material passes between the rollers 23, onto the fitting table, being drawn from the beam on which it is rolled. The endless chain on the fitting table is at this moment stationary as the clutch on the main shaft 39 will be out of gear. This intermittent motion of the fitting table is necessary in order to allow the attendant time to draw off a length of cloth from the roll of same by means of the hand wheel 24 and to fit it in the jaws of the chain as will be hereinafter described, care being taken by the attendant to get the warp and weft of the material at right angles. The amount of cloth drawn off the roll each time will be the length of the fitting table as the chains on the same move that distance before they are stopped by the clutch action before described. The portion of the endless chain however passing over the delivery table is moving as it is necessary to supply a continuous feed to the printing cylinder. This is effected by means of the shaft 13 the chain pulleys 12 of which are continually rotated by means of the driving pulley 67. It is for this purpose that the chain is provided with the slack portion passing under the loose rollers 9, 19. If the fitting table requires adjusting in width the attendant will operate the screws 26 by means of a handle placed on the squared ends of same so as to move farther apart if necessary the frames 2 and consequently the chains to bring the table to the required width and when this is effected the same operation must be gone through with the delivery table by means of the screws 54 and the pulleys 4 and guides 69 must also be shifted. The pulleys 15, 16, 17, 18, 20 and 21 are loose on their shafts and will move with the chain, which will also shift sufficiently on the rollers 9, 19.

The fitting of the material on the table 2 is accomplished in the following way:—The bar

36 being in its turned back position and the material lying on the top of the chain the links of which are in position to be opened by plates 85, the attendant turns down the bar 36 so that it holds the material down on the links and (the plates 85 being all in their raised position and held by the pins 81) lowers the plates 85 by drawing back the pins 81 so that the plates are forced down by their spiral springs and the material is thus thrust within the jaws. This being effected the attendant runs the block 90 along the bar 89 by means of the handle 92 moving it from left to right so that the head 95 acts on the tappets 80 and raises the plates again until they are caught by the spring pin 81 the disk 93 which follows after, pressing down the tails of the links and closing the movable jaw 70 upon the material. In this way the cloth is always kept tight between the jaws until the whole length is fitted, the loose jaws being jammed by the cloth between them and the fixed jaws require no holding in position while the chain is traveling through the machine. When the cloth is fitted the attendant takes off the weight 37 and turns the bar 36 back until another length of material is to be fitted. By the time the length of material is fitted on the table the chain will have started again by reason of the clutch on the shaft 39 being brought into operation and the material evenly stretched will be carried over the pulleys 4 down under the loose roller 9 and onto the delivery table where the tails of the links will be raised by the disk 96 as before described and the material will be drawn off to the printing machine, the first printing cylinder of which is situated close up to the end of the machine and about on the level of the top of the chain so that the material is fed to the cylinder without having to travel any considerable distance so that the stretch which has been imparted to same is not lost before the material is seized by the rolls of the machine after which the material has no opportunity of shrinking back. The chain with the links now open will be carried round under the delivery table over pulley 15 under pulleys 16, 17 over pulleys 18 and under the loose roller 19 the weight of which as it falls in its slot will take up the slack of the chain when the portion of the chain on the fitting table is again stopped by the clutch going out of operation. As soon as the fitting table starts the slack is taken out of the chain and the roller 19 is hauled up to the top of the slot. It will be seen that when the pulleys 4 and the fitting table are stopped the roller 9 will be at the bottom of its slot 10 having just operated on the tappet 49 and consequently opened the clutch as before explained so that there will be a quantity of slack chain for the delivery table to draw from which it does by hauling up the roller until it brings it into contact with the tappet 50 when the pulleys 4 and fitting table are started again in the manner before described.

It will be understood that the screws for regulating the distance apart of the frames are only operated at the commencement of each different printing where the size of the material to be passed through the machine may vary. Say for instance, the engraving on the printing roller measured thirty inches. For this a cloth or material thirty inches wide is taken. This is passed onto the fitting table, the face width of which is set to twenty-nine inches leaving half an inch on each side in the nipping jaws of the chain. The delivery table however, is set to a face width of thirty inches leaving half an inch of the material in the jaws on each side, so that the material has been stretched one inch, which inch forms a selvage edge to the printed article. This will take out of the cloth the contraction in it which has taken place during the manufacture of the same. Without this being done the material cannot be printed accurately. As the material leaves the delivery table it is immediately seized by the "nip" of the printing rolls so that no contraction can take place and it is thus printed in its stretched and straightened condition.

What I claim is—

1. In combination in a cloth stretching machine, a fitting table, a delivery table, endless chains carried by same, said chains provided with carrying devices for the material means for guiding the chains between and under said tables, means for adjusting the widths of said tables, means for adjusting the delivery table longitudinally and laterally, means for releasing the material at the delivery end of the machine from the carrying devices, and means for driving the chains, substantially as and for the purpose described.

2. In combination in a cloth stretching machine a fitting table, a center framework, a delivery table, endless chains having slack portions carried by same, said chains provided with carrying devices for the material slots in the center frame, loose rollers supported in the slots for taking up the slack of the chain, means for adjusting the width of the fitting and delivery tables, adjustable pulleys 4 carried by the center framework, means for releasing the material at the delivery end of the machine from the carrying devices and means for driving the chains, substantially as and for the purpose described.

3. In combination a fitting table and a delivery table, means for adjusting the width of same, endless chains carried by the tables, means for guiding the chains between and under said tables, means for imparting a continuous motion to the chains when on the delivery table and an intermittent motion to the chains when on the fitting table, means for holding the material on the chains and means for causing the holding means to release the material at the delivery end of the machine, substantially as and for the purpose described.

4. The combination with the fitting and de-

livery tables of a center framework, a shaft 39 carried by same, pulleys on the shaft, endless chains having slack portions passing over the pulleys and over the tables, means for holding the material on the chains and means for causing the holding means to release the material at the delivery end of the machine, a driving pulley on the shaft 39, a clutch between the latter and the pulley, slots in the framework, rollers for taking up the slack of the chains, said rollers being carried in the slots, tappets operated by the rollers, a bar carrying the tappets, connections between the bar and the clutch for putting same in and out of gear, driving pulleys 12 on the delivery table, the whole operating to give a continuous motion to the chains when on the delivery table, and an intermittent motion to them, when on the fitting table, substantially as described.

5. In combination a table, frames 3 endless chains carried thereby and provided with means for holding the material, slotted under frames 52 supporting same, nuts carried by the frames 3, a right and left handed screw 54 engaging with the nuts for adjusting the width of the frames 3, a screw 55 in the frame 52, a second under frame 57, a nut 56 secured to same and engaging with the screw 55, said screw adapted to move the frame 52 laterally on the frame 57, means for guiding the frame 52, standards for supporting the frames, means for supporting and guiding the endless chain beneath the frame 52, a base 59 for the standards, slotted beams 59^a, a screwed rod 61, nuts 62, means for operating the rod so as to give the standards a longitudinal movement on the base, means for guiding the standards, means for driving the chains and means for causing the material to be released at the delivery end of the machine, substantially as described.

6. The combination with a fitting and a delivery table, and endless chains composed of links each having a fixed and a movable jaw, of bars 36 carried by the fitting table for holding the material on the fixed jaws of the chains, means for forcing the material into the jaws, means for closing said movable jaws on the material, and means carried by

the delivery table for opening said movable jaws to release the material, substantially as described.

7. In combination the fitting table, a rod 33, a bar 36, carried by same, uprights 76, carried by the bar, rods 79 carried by the uprights, having plates 85, springs on the rods, spring catches carried by the uprights, an endless chain composed of links each having a fixed and a movable jaw on the fixed jaws of which, the bar 36 is adapted to bear and means for raising the rods 79 and plates 85 and for closing the movable jaws of the links, substantially as described.

8. In combination the fitting table, a bar 89 having a rack, a block 90 sliding thereon having a pinion and operating handle, a disk 93, and an arm 94, having a head 95, carried by the block 90, an endless chain having fixed and movable jaws, said movable jaws adapted to be closed by the disk, a movable bar 36 adapted to bear on the fixed jaws of the links to hold the material, spring controlled plates 85, carried by the bar 36, adapted to force the material between the jaws of the links, rods attached to the plates, means carried by the rods with which the head 95 engages, so as to raise the plates from between the jaws, and means for holding the plates in their raised position, substantially as described.

9. The combination with a fitting and a delivery table, of endless chains composed of wedge-shaped links, each consisting of a fixed upright and straight jaw 69, a pivoted movable jaw 70, having a bent tail 72, a boss 73, in the shape of a jaw, and a projection 74, the latter adapted to fit into the boss 73 of the link next in order and a pin 71 passing through the boss 73 into the projection 74 whereby the pin is prevented from working loose when the chain is made up, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM WESTWELL.

Witnesses:

J. B. HOWARD,
CHARLES AINLEY.