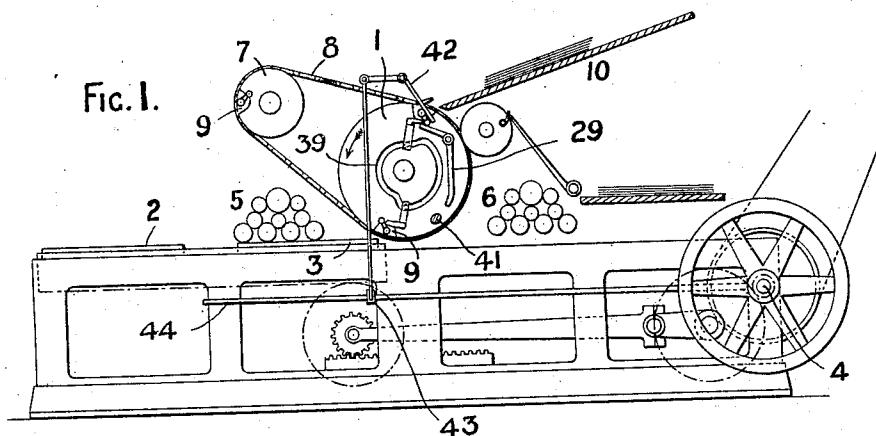
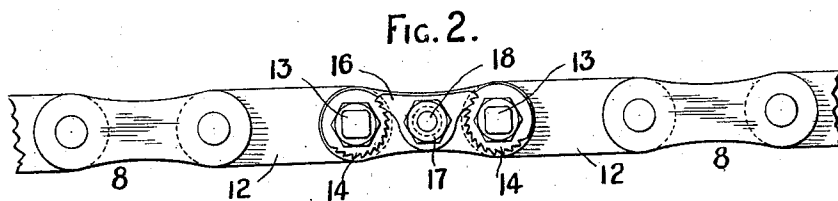
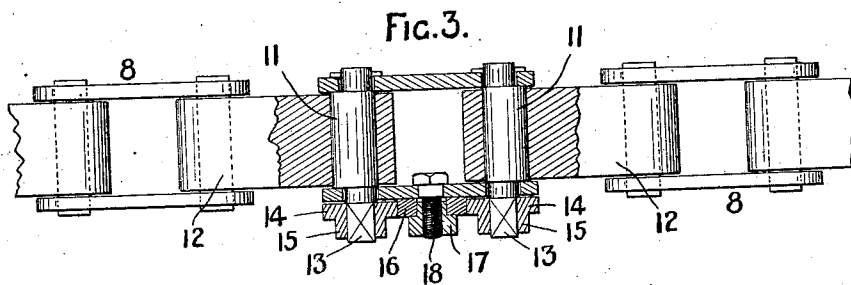
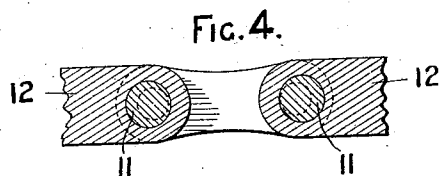


No. 874,640.

PATENTED DEC. 24, 1907.

E. Z. TAYLOR.
PRINTING MACHINE.
APPLICATION FILED JUNE 18, 1907.

3 SHEETS—SHEET 1.



Witnesses:-

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3 SHEETS—SHEET 2.

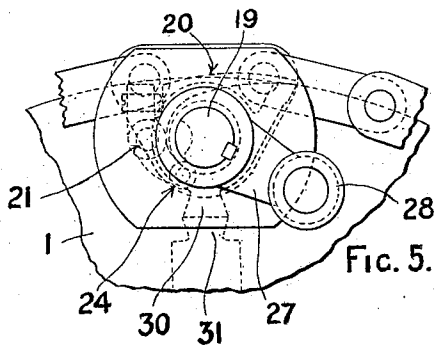


FIG. 5.

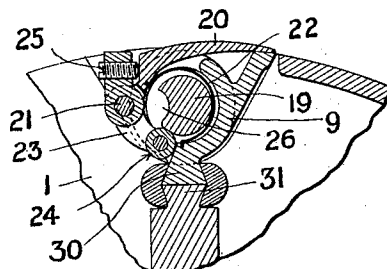


FIG. 7.

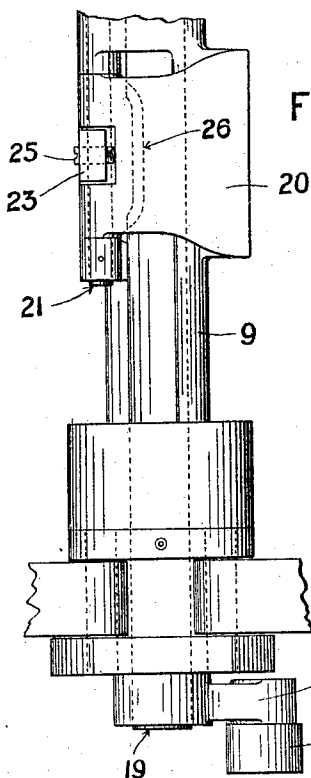


FIG. 6.

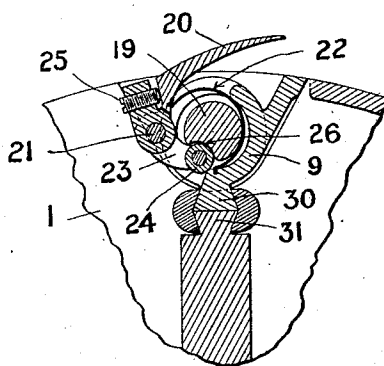


FIG. 8.

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3 SHEETS—SHEET 3.

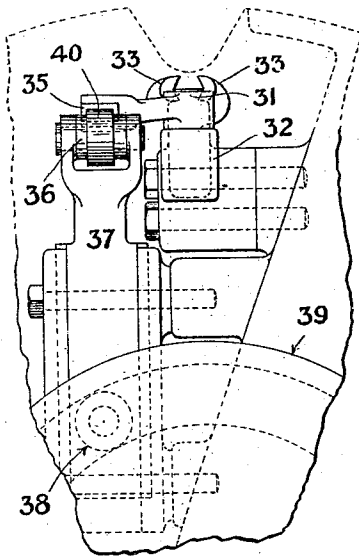


FIG. 9.

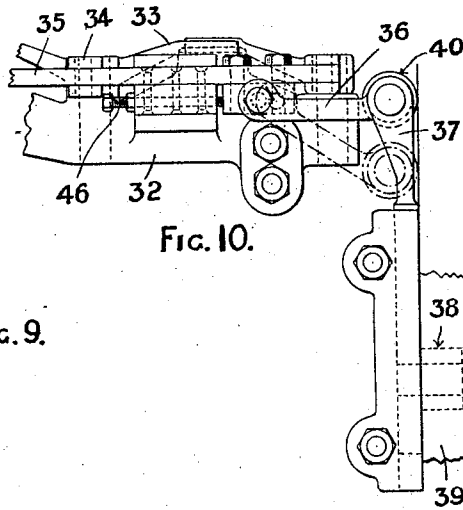


FIG. 10.

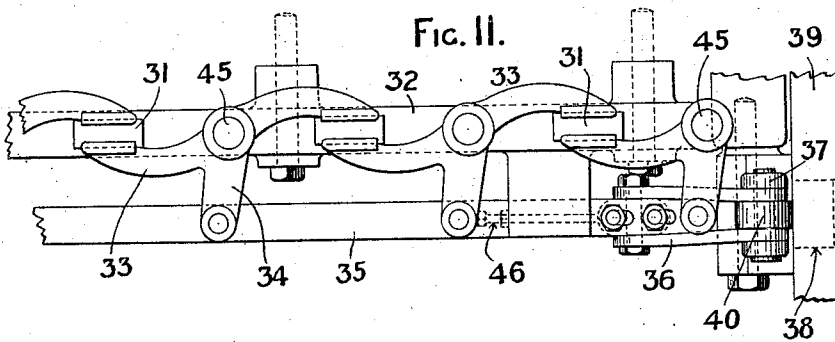


FIG. 11.

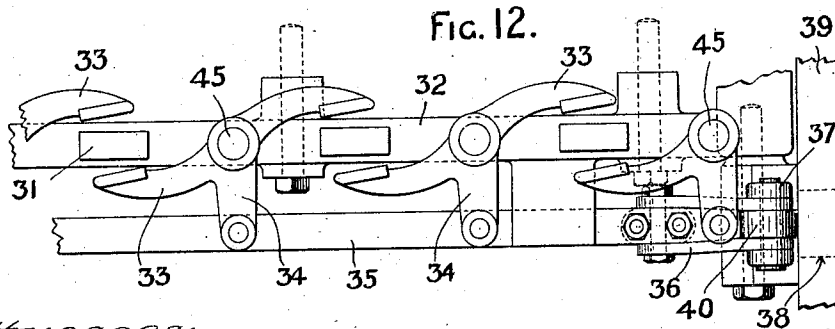


FIG. 12.

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Inventor:

Elmer Zebley Taylor
by *[Signature]*
Attorney

UNITED STATES PATENT OFFICE.

ELMER ZEBLEY TAYLOR, OF LONDON, ENGLAND, ASSIGNOR TO THE MULTI-COLOUR
PRINTING COMPANY (1904) LIMITED, OF LONDON, ENGLAND.

PRINTING-MACHINE.

No. 874,640.

Specification of Letters Patent.

Patented Dec. 24, 1907.

Application filed June 18, 1907. Serial No. 379,557.

To all whom it may concern:

Be it known that I, ELMER ZEBLEY TAYLOR, a citizen of the United States, residing at 46 Peartree street, Goswell Road, London, England, have invented certain new and useful Improvements in Printing-Machines, of which the following is a specification.

This invention relates to improvements in that class of printing machines particularly applicable for printing in two or more colors in which an endless chain or carrier is employed to which gripper bars are secured at intervals, such gripper bars being so constructed and operated that they will take the sheets as they are fed to the machine and transport them from one impression surface to the others in succession, and finally release them when all the desired impressions have been made thereon.

Although my improvements are applicable generally to machines of this class I will describe them in connection with what is known as a two color stop cylinder machine, that is a machine having a rotary impression cylinder divided into two separate impression surfaces, and a pair of reciprocating beds respectively carrying the forms for the different colors, such cylinder being caused to make one complete revolution during the reciprocating movement of the beds in one direction and to remain stationary during the return movement thereof, and the parts being so arranged that during the rotation of the cylinder one sheet will receive an impression in one color from the first bed and another sheet will be printed in another color by the second bed.

My invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a side elevation of sufficient of a machine of the type above specified to enable my improvements to be understood, Fig. 2 is a side elevation of part of the endless chain or carrier illustrating my improved method of adjusting the length thereof. Fig. 3 a plan view of same, partly in section, Fig. 4 a longitudinal section through the adjusting mechanism, Fig. 5 an end view of one of the gripper bars attached to such endless carrier, and Fig. 6 a plan view, and Fig. 7 a cross section thereof with the gripper closed, Fig. 8 a similar view with the gripper open, Fig. 9 a vertical section of the means for clamping the gripper bars to the cylinder, Fig. 10 a side view thereof, and Figs. 11 and

12 plan views thereof respectively showing the clamps in their closed and open positions, the gripper bars however not being shown.

Referring now to Fig. 1 of these drawings, it will be seen that the machine there illustrated is provided with an impression cylinder 1 carried in suitable bearings (not shown) and formed with a cut-away portion so that during the return movement of the reciprocating beds 2, 3, such beds do not make contact therewith. The beds 2, 3, are operated from the driving shaft 4 by means of the gearing and connecting rod usual in machines of this type, but which as it constitutes no essential feature of the present invention requires no detailed description here. During what may be termed the outward stroke of the beds 2, 3, the frame on which they are mounted actuates the cylinder 1 by means of a rack carried by such frame and gearing with a toothed wheel mounted on the shaft of the cylinder, causing the latter to make exactly one complete revolution, at the end of which the cylinder is stopped while the beds make their return movement. Suitable inking apparatus 5, 6, is provided for inking the forms 2, 3, and these as in known machines are arranged to be lifted during the passage beneath them of the forms they are not required to ink.

Passing round the cylinder 1 and also round a second guide cylinder 7 suitably disposed in relation thereto is the endless chain or carrier 8, to which a number of gripper bars 9 are secured at intervals. The number of such gripper bars is usually one in excess of that of the number of colors to be printed, or one more than a multiple of such number of colors, and the cylinder 7 is arranged at such distance from cylinder 1 that each time the cylinder stops an empty gripper will be in position to receive a sheet from feed board 10. In the machine illustrated, which as above stated is designed for printing in two colors, three gripper bars 9 are shown as being secured to the carrier 8, and the total length of the latter is equal to one and a half times the circumference of cylinder 1, so that the second cylinder 7 must be arranged at such a distance from cylinder 1 as will allow for this length of carrier.

To finely adjust the length of the carrier 8 and to allow for wear, I employ the means illustrated in Figs. 2, 3, and 4, in which it will

be seen that the pivots or studs of certain of the links of the chain are formed with eccentric portions 11, which are engaged by the adjoining links 12. The studs 11 are formed with squared ends 13 on which ratchets 14 are secured, such ratchets being suitably formed with hexagonal or like heads 15 so that they and the eccentric studs on which they are mounted can be turned by means of a spanner. Mounted on the link through which both the eccentric studs pass, and centrally between the latter, is a double ended pawl 16, each end of which engages with one of the ratchets 14. Such pawl is carried on a shouldered nut 17 screwed on to a bolt 18 passing through the link.

Should it be desired to adjust the length of the chain or carrier 8, the nut 17 must be unscrewed from bolt 18 sufficiently far to withdraw its shoulder from pawl 16, when the ratchets 14 can be turned in either direction to vary the position of the eccentric portions of the pivots or studs and consequently the distance between the links 12 mounted thereon. When the desired adjustment has been effected the nut 17 is screwed home again, returning pawl 16 into engagement with ratchets 14, which will thus be secured in the position to which they have been moved. It will be seen that any tension on the chain or carrier 8 will have a tendency to turn the eccentric studs in opposite directions, and that in each case this will be in the direction in which such movement is prevented by the pawl 16 engaging ratchets 14, and that therefore the strain of one will be balanced and counteracted by that of the other.

As hereinbefore stated the carrier 8 has secured to it a number of gripper bars, these being adapted to take sheets from the feed board 10 and convey them into contact with the printing forms, such gripper bars remaining attached to the sheets until the latter are ready for delivery. These gripper bars are illustrated in detail in Figs. 5, 6, 7 and 8, and each comprise a bar 9 of approximately the same length as the impression cylinder 1 in connection with which they operate, a shaft 19 passing through such bar 9, and a series of gripper blades 20 pivoted on a shaft 21 also carried by such bar 9. Each of the gripper blades 20 is acted on by a spring 22 connected to the bar 9 and also to the blade 20, and tending to keep such blades normally open. On shaft 21 are pivoted a series of short cranks 23, carrying rollers 24 at their outer ends, while through their inner ends screws 25 pass and act against shoulders on the gripper blades so as to enable the pressure of the outer ends of the latter on the gripper bar 9 to be regulated. The rollers 24 carried by cranks 23 are adapted during the operation of the apparatus to enter semicircular recesses 26 formed in the shaft 19 passing centrally through the gripper bar 9. Such

shaft 19 carries at its outer end a crank 27 provided with a roller 28 adapted to be acted on by a cam lever 29 pivoted on the side of the cylinder as shown in Fig. 1, and caused to act on such roller by a cam 41 mounted on the side frame of the machine, the turning movement thus imparted to such shaft having the effect when the gripper blade 20 is closed as shown in Fig. 7 of bringing the semicircular recess 26 in shaft 19 opposite the roller 24 carried by crank 23, thus permitting the gripper blade to open under the action of its spring 22, as shown in Fig. 8. The gripper blade will be held open until, after a sheet has been placed in position therein from feed board 10, shaft 19 is turned in the opposite direction by cam lever 42 operated by a cam 43 on shaft 44 acting against roller 28, and the recess 26 thus brought back to the position shown in Fig. 7, forcing the gripper blade 20 down to grasp the sheet. The parts will be retained in this position until shaft 19 is again operated, as the gripper blade cannot open under the action of its spring 22 except when roller 24 is in the recess 26 in such shaft.

The gripper bar 9 is formed with a projection of dovetail or other suitable shape, as shown clearly at 30 in Figs. 7 and 8, by means of which it can be securely held in position when in contact with the impression cylinder or cylinders, and the latter are also provided with projections 31, preferably of the same shape, with which the part 30 of the gripper bar comes in contact as the latter arrives at the cylinder.

The projections 31 are carried by a casting or frame 32 securely bolted to the cylinder 1, as shown in Fig. 9, and are so situated that the projection 30 of the gripper bar will come in contact therewith as the latter enters the cylinder. To clamp the projections 30 and 31 together, and consequently the gripper bar to the cylinder, I employ a series of double ended clamps 33, (Figs. 10, 11 and 12) the inner faces of which are shaped to exactly fit along the sides of the projections 30 and 31 when same have been brought together, so that should the projection 30 of the gripper bar not be exactly in its proper position before the parts are clamped together, the closing of the clamps on the movable part 30 and the immovable part 31 will immediately correct same, thus insuring that the sheet carried by the gripper bar will receive the different impressions in absolutely perfect register.

To operate the clamps 33 I provide each of same with an additional arm 34 which is pivoted to a bar 35 capable of longitudinal movement in the cylinder, such bar 35 being caused to reciprocate at the proper times for opening and closing the clamps by means of links 36 connecting same to a sliding bar 37 operated by a roller 38, acting in connection

with a cam 39 carried by the side frame of the machine.

At the point where the links 36 are pivoted to the slide 37 I mount a roller 40 which runs in contact with the inner surface of the end of the cylinder.

It will be seen that when the slide 37 is in its outward position the links 36 and bar 35 will be in approximately a straight line, as shown in full lines in Fig. 10, this being the position when the clamps are closed on the projections 30 and 31, and that consequently the parts will be practically clamped together, as the direction of thrust on the bar 35 which would tend to open the clamps 33 is in a straight line to the inner surface of the end of the cylinder.

The cam 39 is so arranged on the side frame of the machine as to cause the clamps 33 to close immediately a gripper bar has taken its position in the cylinder, and to open at the point where such gripper bar leaves.

The clamps 33 are pivoted by studs 45 to the frame 32, which is securely bolted to the cylinder, and a screw 46 passing through a lug on bar 35 bears against the pivot block connecting links 36 and bar 35, and (as the holes for the bolts securing such pivot block are elongated) thus enables the length of such bar and consequently the pressure of the clamps 33 on projections 30 and 31 to be regulated as desired.

It will be readily understood that any convenient number of the double ended clamps 33 may be employed to secure the gripper bar in place, and further that as shown the end clamps may have one clamping arm only.

What I claim as my invention, and desire to secure by Letters Patent, is:—

1. In a printing machine the combination with a carrier and a series of gripper bars attached thereto, of means for adjusting the length of such carrier comprising eccentric studs connecting two of the links thereof and a pawl engaging ratchets mounted on such eccentric studs, substantially as and for the purpose specified.

2. In a printing machine the combination with a carrier of a gripper bar provided with a series of gripper blades, springs for holding such blades normally open, a shaft mounted in such gripper bar, and formed with depres-

sions, and cranks adapted to be actuated by such depressions and acting against the inner ends of the gripper blades, substantially as and for the purpose specified.

3. In a printing machine the combination with a carrier of a gripper bar provided with a series of gripper blades, springs for holding such blades normally open, a shaft mounted in such gripper bar, and formed with depressions, cranks adapted to be actuated by such depressions and acting against the inner ends of the gripper blades, and means for adjusting the contact between the cranks and gripper blades and thereby the pressure of the latter on the sheet held by the gripper bar, substantially as specified.

4. In a printing machine, the combination of a carrier, a gripper bar provided with a series of gripper blades and a plurality of projections, springs for holding said blades open, a shaft mounted in said gripper bar, a cylinder for said carrier provided with projections adapted to be engaged by said bar projections, and means for engaging and disengaging said bar projections with and from said cylinder projection.

5. In a printing machine the combination of a carrier, a gripper bar, dovetailed projections formed thereon, a cylinder, similar projections carried thereby, and a series of clamps operated by a cam and links and each adapted to fit around the projections on the gripper bar and cylinder to adjust the position of such gripper bar and hold it firmly in place, substantially as specified.

6. In a printing machine the combination of a carrier, a gripper bar, dovetailed projections formed thereon, a cylinder, similar projections carried thereby, a series of clamps operated by a cam and links and each adapted to fit around the projections on the gripper bar and cylinder to adjust the position of such gripper bar and hold it firmly in place, and means for adjusting the pressure of the clamps on the gripper bar, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

ELMER ZEBLEY TAYLOR.

Witnesses:

H. D. JAMESON,
F. L. RAND.