No. 811,270. PATENTED JAN. 30, 1906.

H. F. BECHMAN.

WEB LOOPING MECHANISM.

APPLICATION FILED NOV. 21, 1904.

Fig. 1.

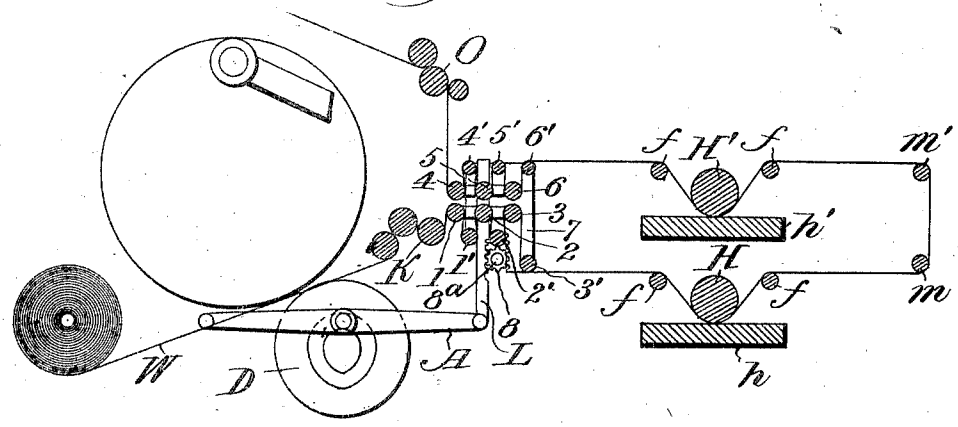


Fig. 2.

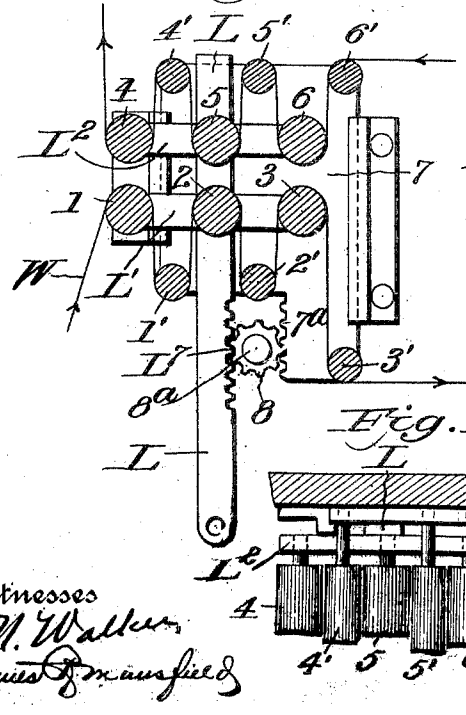


Fig. 3.

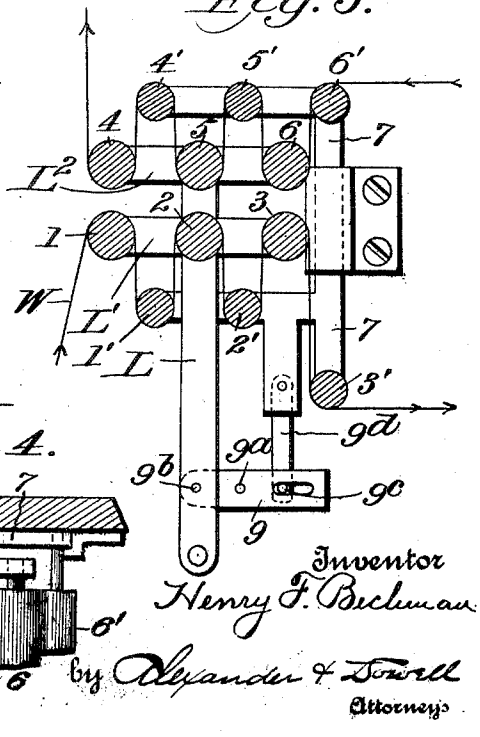


Fig. 4.

Witnesses

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HENRY F. BECHMAN, OF BATTLECREEK, MICHIGAN, ASSIGNOR TO THE DUPLEX PRINTING PRESS COMPANY, OF BATTLECREEK, MICHIGAN.

WEB-LOOPING MECHANISM.

No. 811,270. Specification of Letters Patent. Patented Jan. 30, 1906.

Application filed November 21, 1904. Serial No. 233,639.

To all whom it may concern:

Be it known that I, HENRY F. BECHMAN, of Battlecreek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Web-Looping Mechanism; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improvement in web-manipulating mechanisms especially adapted for imparting intermittent movements to parts of an otherwise continually-running web, and particularly designed for use in connection with stationary-bed reciprocating-cylinder web-printing presses, known to the trade as "duplex" web-perfecting flat-bed presses. The invention, however, is also useful in connection with other machines operating upon webs.

The object of the present invention is to reduce the eccentricity of the looper-cams and slow up and lessen the movement of the looping-rollers by increasing the number of the looping-rollers and moving the upper and lower coacting loopers in opposite directions.

The invention consists in the novel construction and combinations of parts hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a diagrammatical longitudinal section through a duplex web-perfecting flat-bed press with my improved web-looping devices. Fig. 2 is an enlarged sectional view of the looping mechanism detached. Fig. 3 is a similar view of a modified construction of the looping mechanism. Fig. 4 is a detail.

The type-beds *h h'* and their coacting cylinders H H', web-guides *f m m'*, web-feeding mechanism K, and web-delivery mechanism O may be constructed and operated like similarly-lettered parts in the Cox patent, No. 478,503, of July 5, 1892. The looping devices may be operated by reciprocating bars L, levers A, and cams D, as in Cox's patent, No. 501,456, of July 11, 1893, and need no further explanation herein, the operation being such that the web W is fed into the press continuously by the rolls K and delivered out of the press continuously by the rolls O, and the part of the web in the press is alternately stopped during the printing and then moved forward with greater rapidity by the action of the web-looping devices between the feed and delivery, said looping devices taking up the web fed in by rolls K and giving up web to the rolls O during each printing operation and thereafter quickly shifting the web forward, all substantially as described in said patents.

As shown, a number of lower looping-rollers 1 2 3 and a corresponding number of upper looping-rollers 4 5 6 may be mounted on transverse cross-pieces $L' L^2$, attached to bar L. The rollers 1 2 3 are parallel and in a plane at right angles to the line of movement of bar L, and the rollers 4 5 6 are similarly disposed above the others.

Below the rollers 1 2 3 are coöperating rollers 1′ 2′ 3′, and above the rollers 4 5 6 are coacting rollers 4′ 5′ 6′. All the rollers 1′ 2′ 3′ 4′ 5′ 6′ are supported on a movable frame or plate 7, which is movable parallel with bar L and is mounted in any suitable guides on the main frame of the machine. Frame 7 may get motion from bar L, but is moved oppositely thereto, so that the rollers 1 2 3 move oppositely to their coacting rollers 1′ 2′ 3′, and, similarly, the rollers 4 5 6 move oppositely to their coacting rollers 4′ 5′ 6′.

The desired opposite movements of the bar L and frame 7 may be imparted in various ways. In Fig. 1 the frame 7 has a depending toothed part 7^a (see Fig. 2) opposite a similarly-toothed part L^7 on bar L, and a pinion 8, journaled on a fixed stud 8^a, meshes with said toothed parts on its opposite sides, so that the motion of one gives a contrary movement to the other. In Fig. 3 the same result is obtained by means of an oscillating lever 9, pivoted on a stationary fulcrum 9^a, one end of said lever being connected at 9^b with the bar L and the other end of the lever being connected at 9^c to the lower end of a link 9^d, attached to frame 7, so that the movement of bar L in one direction imparts an opposite motion to frame 7.

I prefer to give equal movements to both sets of rollers; but it is obvious that this is not essential and that the connections may be arranged so as to impart different relative movements to the bar and frame.

It should be understood that the bar and frame are duplicated at each side of the press,

so as to properly support the rollers at each end. As shown, the roller 3′ is arranged below the plane of rollers 1′ 2′ and performs the office of the stationary guide-roller ordinarily employed in the duplex machine, (shown at M′ in Cox's patent, No. 478,503.) Roller 4′ also performs the office of the stationary guide-roller ordinarily employed in the duplex press, (shown at M in said Cox patent.)

The web is fed in by rolls K, then looped over roller 1, under roller 1′, over roller 2, under roller 2′, over roller 3, under roller 3′, and passed forward through the printing mechanism, as in the Cox patent. Returning, it is looped over upper roller 6′, under roller 6, over roller 5′, under roller 5, over roller 4′, under roller 4, and then passed to the delivery O. This construction gives three upper and three lower loops in the web, whereas in the ordinary duplex press but one upper and one lower loop is formed. This increase in the number of loops reduces the ordinary travel of the looping-frame two-thirds, and this travel is further reduced by making the rollers move in opposite directions, and if they move equal distances the travel of the looping-frame and rollers is reduced to one-sixth the travel required in an ordinary duplex press while the same amount of web is taken up and given off. This lessened throw of the frames correspondingly reduces the eccentricity or throw of the cam, which is desirable.

The movement of the rollers in opposite directions also balances or tends to equalize the strain on the equalizer-cams or the weight of the rollers thereon, so that the movement is easier and more uniform in both up and down movements of the equalizer-levers.

I do not confine myself to the employment of any particular number of oppositely-moving looping-rollers, nor to the particular mechanism for operating them in opposite directions shown in the drawings, except as specifically mentioned in some of the claims which follow.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is —

1. In web-looping mechanism, the combination of a plurality of pairs of oppositely-moving rollers each pair of rollers coöperating to form a loop in the web, the web being directed over and under opposite rollers in alternation and means for operating said rollers.

2. The combination with web-feeding mechanism of two adjacent sets of web-rollers movable in opposite directions, the web being directed over and under the oppositely-moving rollers in alternation to form loops in the web, substantially as described.

3. The combination of two adjacent series of web-rollers, the web being passed alternately over and under the successive rollers in each set; with means for simultaneously moving the sets of rollers in opposite directions to form loops in the web, substantially as described.

4. In a web-manipulating mechanism, the combination of oppositely-moving devices, adjacent looping-rollers respectively mounted on said devices, the web being directed over said rollers in alternation, the opposite looping-rollers coacting to form a loop in the web, substantially as described.

5. In a web-manipulating mechanism, the combination of oppositely-moving devices, a plurality of pairs of looping-rollers mounted on said devices, each pair of oppositely-moving rollers coacting to take up or give out a loop of web, and means for operating said devices.

6. In combination means for feeding and delivering a web, a web-looping mechanism intermediate the feed and delivery devices, comprising oppositely-moving rollers, coacting to alternately take up and give off a loop of web the web being directed over and under the opposite rollers in alternation, substantially as described.

7. In combination a movable support, a looping-roller thereon, an adjacent movable support, a looping-roller thereon, and means whereby one support moves the other in an opposite direction, said looping-rollers coacting to form a loop in the web, substantially as described.

8. In combination two looping-rollers mounted on a movable support, two other looping-rollers coacting with the first-mentioned looping-rollers to form loops in the web and mounted on a second movable support; with means for moving the said supports simultaneously but in opposite directions, for the purpose and substantially as described.

9. In combination web-feeding-in devices and web-delivery devices; with web-looping mechanism intermediate the feed and delivery devices, comprising two looping-rollers mounted on a movable support, and two other adjacent looping-rollers mounted on another adjacent movable support and coöperating with the first-mentioned rollers to form loops in the web, and means for simultaneously moving said supports in opposite directions, substantially as described.

10. In combination means for feeding and delivering a web, a web-looping mechanism intermediate the feed and delivery, comprising two sets of oppositely-moving rollers, one set taking up loops in the web while the other set gives out loops, the sets taking up and giving off loops in alternation, substantially as described.

11. In combination a movable support, web-looping rollers mounted thereon, an adjacent movable support, web-looping rollers mounted thereon, means for operating one support, and means whereby one support

moves the other, but in an opposite direction, for the purpose and substantially as described.

12. In combination two sets of looping-rollers mounted on a common support, two sets of looping-rollers coacting with the first-mentioned sets of looping-rollers, and mounted on another common support; with means for moving the supports of the first and second sets of looping-rollers simultaneously but in opposite directions, for the purpose and substantially as described.

13. The herein-described web-looping mechanism comprising two sets of looping-rollers mounted on a common movable support, and two other sets of looping-rollers mounted on another common movable support, and means for simultaneously moving said supports in opposite directions, each set of looping-rollers on one support coöperating with the adjacent set of looping-rollers on the other support, for the purpose and substantially as described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

HENRY F. BECHMAN.

In presence of—
CHARLES A. GRAMES,
FRANK W. DUNNING.