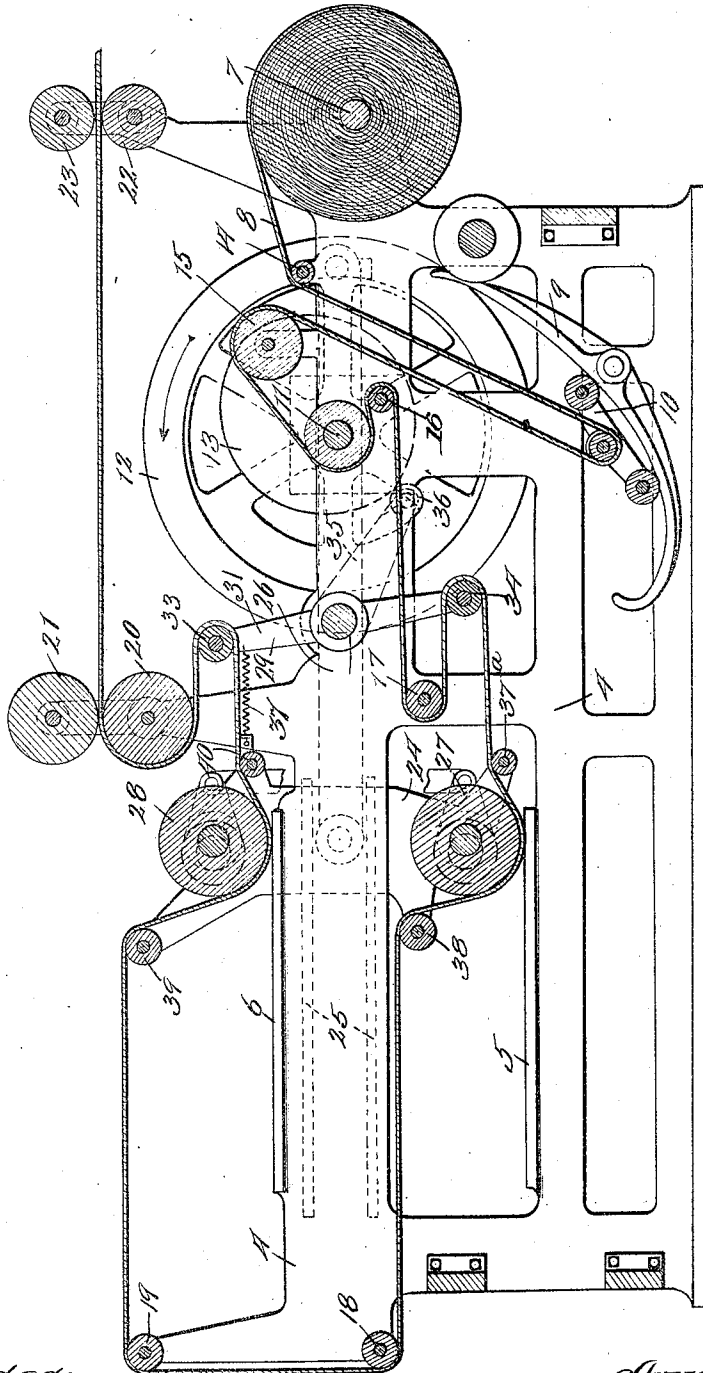


P. F. COX.
PRINTING PRESS.
APPLICATION FILED MAY 5, 1910.

1,052,712.

Patented Feb. 11, 1913.
2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
Chas. D. Perry
W. A. Turner.

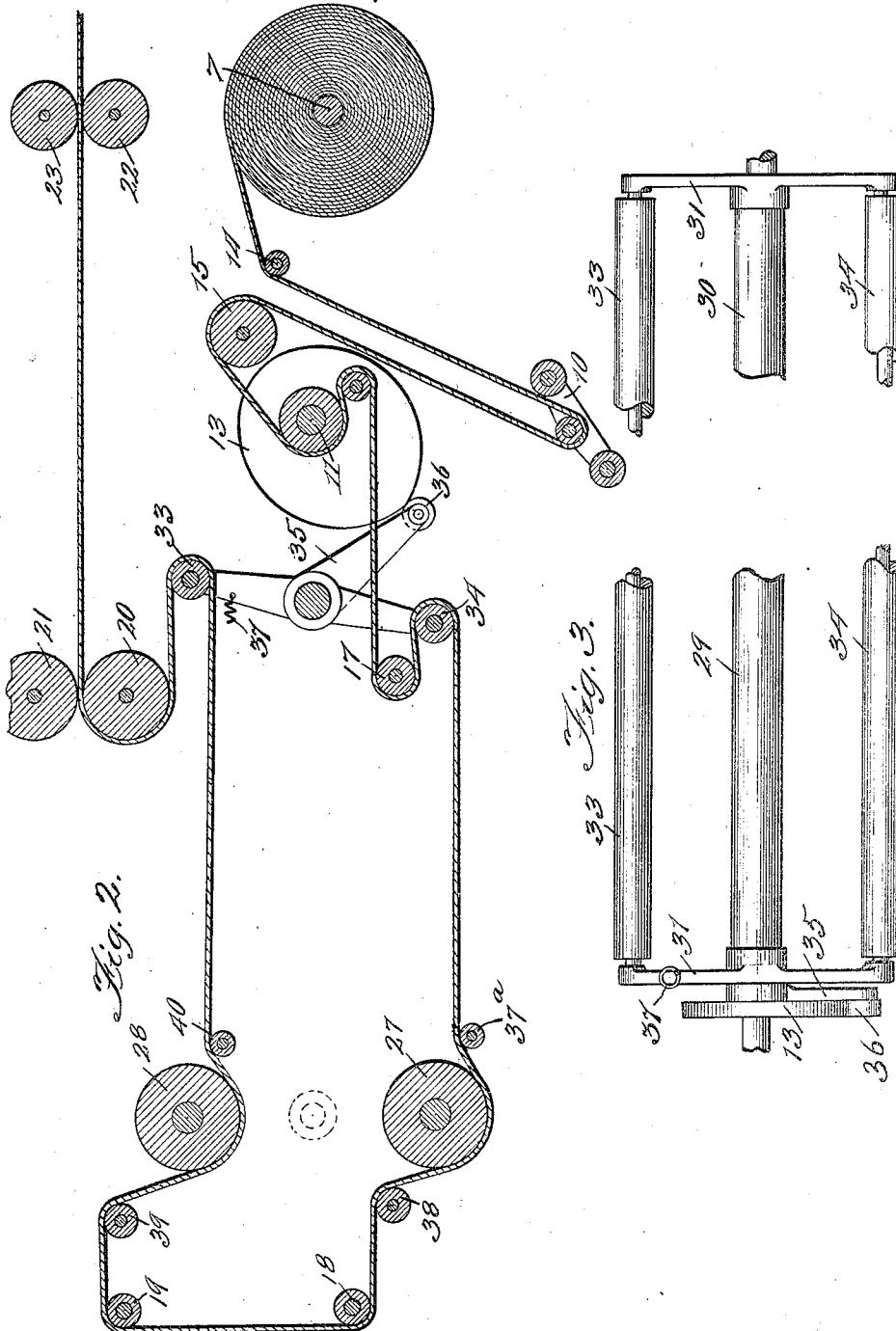
Inventor:
Paul F. Cox
by
Ben Adams, Richard J. Jensen
Attys.

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2 SHEETS—SHEET 2.



Witnesses:
Ed D. Perry
W. A. Furner

Inventor:
Paul F. Cox
By Adams, Nixon & Adams
Attorneys

UNITED STATES PATENT OFFICE.

PAUL F. COX, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE GOSS PRINTING PRESS COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PRINTING-PRESS.

1,052,712.

Specification of Letters Patent.

Patented Feb. 11, 1913.

Application filed May 5, 1910. Serial No. 559,467.

To all whom it may concern:

Be it known that I, PAUL F. COX, a citizen of the United States, residing at Chicago, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Printing-Presses, of which the following is a specification, reference being had to the accompanying drawing.

My invention relates to web-printing presses and particularly to that type of web-printing presses in which the web is printed by traveling impression cylinders moving back and forth, each across its own type-bed, causing an impression when moving in one direction and being raised from the type-bed in their return movement; and its object is to provide a new and improved mechanism by which the compensating loops in the web are taken up and let off to compensate for the holding of the portion of the web which is being printed upon stationary during the printing.

In the drawings,—Figure 1 is a vertical section through such a press, showing my improved loop forming mechanism, and showing the impression cylinders at the end of their printing stroke; Fig. 2 is a diagrammatic illustration of the essential features, shown in Fig. 1, showing the impression cylinders at the end of their return stroke and ready to begin their printing movement; Fig 3 is an enlarged detail being a view of the rocking frame by which the looping of the web is effected, and broken away.

Referring to the drawings:—4 indicates the frame of the press having type-beds 5—6.

7 indicates a roll-spindle carrying the web 8.

9 indicates a guide upon which travels web-governor 10, which is of the well known type and description, described in previous patents to me, and forming no part of my present invention except as an element in the combination, need not be further described.

11 indicates the main driving shaft of the press carrying at one end a fly-wheel 12.

13 indicates a cam which is secured upon the shaft 11 toward one side of the press.

14—15—16—17—18—19 indicate rollers which are journaled in any suitable manner upon the frame 4, and around which the web passes as indicated in Figs. 1 and 2.

It will be seen further from Figs. 1 and 2 that the rollers 14 and 15 constitute supports for a downwardly extending loop of the web in which the governor 10 rests by gravity, thereby preventing the direct and positive feed of the looper 34 jerking upon the web roll 7 and thus breaking the web. It will be understood that the mechanism and arrangement just described, together with the coöperating parts constitutes an embodiment of means for forming a reserve loop between the looper 34 and the web roll.

20—21 indicate driven rollers driven by any appropriate mechanism, not shown, which travel at a constant speed and operate as forwarding rollers, to pull the web through the press in the well known manner. 22—23 indicate other driven forwarding rollers mounted upon suitable brackets on the framework, and operating to forward the web into any other mechanism for subsequent treatment.

24 indicates a carriage which travels on suitable guides, as 25 (see dotted lines in Fig. 1), and reciprocates backward and forward over type-beds 5—6. The carriage is reciprocated by any suitable mechanism, as by connecting rod 26 pivotally connected at one end with said carriage and at the other end with fly-wheel 12. This reciprocating mechanism, however, may be of any well known kind and description, and forming no part of my present invention, and being well understood, it is believed that it is unnecessary to describe it further here.

27—28 indicate impression cylinders which are journaled in carriage 24 and which coast with the type-beds 5—6, respectively, to print the paper. It will, of course, be understood that in the completed press the impression cylinders will be supplied with mechanism adapted to raise them from the type-bed, at the end of their impression stroke, for the return stroke, and to lower them at the end of the return stroke, for the impression stroke. Such mechanisms are well understood in the art, and, as far as my invention is concerned, may be of any well known kind and mode of operation, forming no part of my present invention, and, therefore, I believe it is not necessary to fully illustrate or describe the same, and have accordingly only indicated the same in the drawings in order to avoid unnecessary complexity and confusion therein.

29 indicates a rocking frame which is shown in detail, broken away, in Fig. 3, and which is composed of a rock-shaft 30, journaled in the frame of the machine, side bars 31, secured midway of their length upon the rock-shaft 30, and rollers 33—34 journaled at each end of the side bars 31.

35 indicates an arm rigid with the rock-shaft 30, and carrying at its outer end a roller 36, which registers with the surface of the cam 13, and is held against the same by an extension coiled spring 37 which connects one of the side-bars 31 with a suitable part of the frame 4. I have shown the cam 13 as an open one with the roller held against it by a spring, but it is, of course, obvious that a closed cam may be used instead if desired.

By reference to the drawing it will be noted that the reserve loop of variable length is maintained in the web 8 between the web roll on support 7 and the loop formed over looper roll 34, and which takes a definite feed of web so as to space or position the web properly upon the forms.

As the main driving shaft rotates, carrying the parts in the direction shown by arrow in Fig. 1, the cam will operate through the rock-arm to rock the rock-shaft and thus rock the frame, moving the rollers 33—34 backward and forward. The differences between the high and the low part of the cam will be so proportioned, and the other parts so proportioned, that the rollers 33—34 will travel just the right amount to take up and give off the proper length of web. For instance, in the construction shown, if the length of the printed page, in the direction of the travel of the cylinders, is 22 inches, the rollers will travel back and forth through a space of $5\frac{1}{2}$ inches so as to make a loop, taking up or giving out, in each case, 11 inches of the web. The web, from the web-roll 7, passes over roller 14, through the web-governor 10, over rollers 15—17, over roller 34 on the lower end of the rocking frame, over guide-roller 37^a which is journaled in carriage 24, under impression cylinder 27, over guide-roller 38 which is journaled in carriage 24, over rollers 18—19, over roller 39 journaled in carriage 24, under impression cylinder 28, over roller 40 journaled in carriage 24, backward and partially around roller 33 at the upper end of the rocking frame 29, backward partially around roller 20, and between it and roller 21, and forward between rollers 22 and 23.

The operation of the mechanism is as follows: In Fig. 1, as has been said, the impression cylinders are at the end of the impression stroke, the roller 36 is at the lowest point of the cam, and the frame has been rocked so that the upper roller 33 is at its extreme left position in Fig. 1, the roller

34 at its extreme right position, and has taken up a loop in the web, the printed portion of which has been held stationary, in the well known manner, during the forward or printing movement of the impression cylinders. At this moment the return movement of the impression cylinders, lifted from the type-bed in any well known way, begins, and the web is free to move between the impression cylinders and the type-bed. The cam, operating upon roller 36, begins to rock the frame 29 back again, that is to say, it moves the upper roller 33 to the right and the lower roller 34 to the left. The constantly traveling rollers 20—21 and 22—23 carry the web forward, and the roller 34, traveling to the left during this return movement of the cylinder, gives up to the traveling web the loop which has been formed by its movement to the right. At the same time the roller 33, moving to the right, forms a loop in the web, and of the same length as the loop that has been formed by roller 34 and which is now being given up, as above set forth, until, at the completion of the return stroke of the cylinders, the parts have reached the position shown in Fig. 2, in which the entire loop formed by the roller 34 is given up and a new loop of the same length made in the web by roller 33, and by the combined action of the roller 33 and the feeding rollers 20—21 the web has been moved forward one page length through the press and is ready for the next impression. The impression cylinders then descend upon the type-bed and begin their impression movement. As soon as they close upon the type-bed the web is, of course, prevented from moving forward at any point between the lower impression cylinder and roller 33. The roller 33, however, thereupon moving to the left, gives up the material of the loop, just taken up by it, to the constantly driven rollers 20—21 and the web, continuously fed into the machine from the web roll, is taken up into a loop by the movement toward the right of the roller 34 until the parts are again in the position shown in Fig. 1. The direct rigid connections between the loopers and their cam shaft, and also the reserve loop between the web roll and the first looper coöperate to avoid the frequent breakages of the web which have heretofore constituted one of the greatest drawbacks in this kind of presses. The long and vexatious delays, the tedious and unpleasant labor, and the great loss of time in getting out a newspaper edition, resulting from such breakages, as well as the other attendant drawbacks will be clearly understood without detailed explanation thereof. Of course the above operation is repeated with each reciprocation forward and backward of the impression cylinders. By the construction

above described, in which a swinging frame is used to form the loops, I am enabled to provide a much simpler construction than has heretofore been used, for the alternate forming and giving up of the loops in the web, and do away with considerable complication of mechanism, and also provide a looping mechanism which may be driven directly from the main driving shaft of the press.

That which I claim as my invention and desire to secure by Letters Patent is:—

1. A web printing press including in combination two stationary beds, one above another, a reciprocating carriage, a driving shaft, connections between said driving shaft and said carriage to reciprocate the carriage, two impression cylinders mounted on said carriage and adapted to roll along said beds to perfect a web, vibrating web looping means, an actuating device fixed to said shaft, and rigid connections from said web looping means to said actuating device whereby said looping means is vibrated.

2. A web printing press including in combination a plurality of stationary type beds, a carriage reciprocating along said type beds, impression cylinders mounted on said carriage and adapted to roll along said type beds to perfect a web, a driving shaft, connections between said shaft and carriage to reciprocate the carriage, a web looping device comprising bars supporting a roller over which the web passes and an arm rigid with said bars, and a cam fixed on said driving shaft directly actuating said rigid arm to vibrate said looping device.

3. A web printing press including in combination two fixed beds one above another, a carriage reciprocating along said beds, a driving shaft, connections from said driving shaft to said carriage to reciprocate the carriage, two impression cylinders mounted on said carriage and adapted to roll along said beds to perfect a web, web looping means comprising a vertically arranged rocking frame journaled intermediate its ends, a single roller at each end of said rocking frame over which the web passes, and comprising an arm rigid with said frame, and an actuating device for said arm fixed on said driving shaft.

4. A web printing press including in combination two fixed beds one above another, a carriage reciprocating along said beds, a driving shaft, connections from said driving shaft to said carriage to reciprocate the carriage, two impression cylinders mounted on said carriage and adapted to roll along said beds to perfect a web, web looping means comprising a vertically arranged rocking frame journaled intermediate its ends, a sin-

gle roller at each end of said rocking frame over which the web passes, and comprising an arm rigid with said frame, and a cam fixed on said driving shaft and directly actuating said rigid arm.

5. A web printing press including in combination two stationary beds, two impression cylinders adapted to roll along said beds to perfect a web, means for actuating said cylinders, means for forming a loop in said web of definite length before it passes to the first bed and after it leaves the second bed, means located between said loop forming means and the source of web supply comprising supports for a downwardly extending loop and a freely moving member resting by gravity in said downwardly extending loop, to maintain a variable reserve loop between the web supply and said definite loop forming means.

6. A web printing press including in combination a source of web supply, two stationary beds, two impression cylinders adapted to roll along said beds to perfect a web, means for actuating said cylinders, means for intermittently forming in the web a loop of definite length after it passes from the second bed, means for intermittently forming in the web a loop of definite length before it passes to the first bed, and means for forming a reserve loop between the source of web supply and said last mentioned intermittent loop forming means.

7. A web printing press including in combination two stationary beds, two impression cylinders adapted to roll along said beds to perfect a web, means for actuating said cylinders, means for forming a loop in said web of definite length before it passes to the first bed and after it leaves the second bed, means located between said loop forming means and the source of web supply comprising supports for a downwardly extending loop and a freely moving member resting by gravity in said downwardly extending loop, and guides to control the travel of said freely moving member.

8. A web printing press including in combination a stationary form bed, an impression cylinder adapted to roll along said bed, a web supply, means located between said form bed and web supply for intermittently forming a loop in said web, means for forming a reserve loop between said intermittent loop forming means and said web supply, and means for forwarding the web from said form bed.

PAUL F. COX.

Witnesses:

CHARLES E. PICKARD,
W. H. DE BUSK.