No. 880,281. PATENTED FEB. 25, 1908.

P. F. COX.

PRINTING PRESS.

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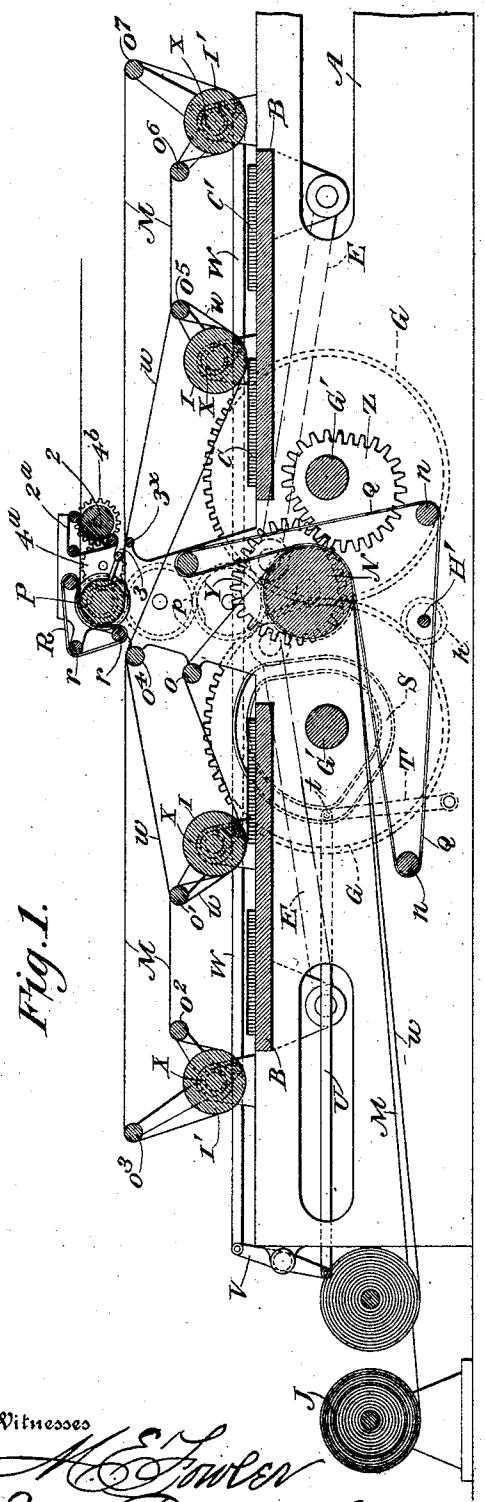

Fig. 1.

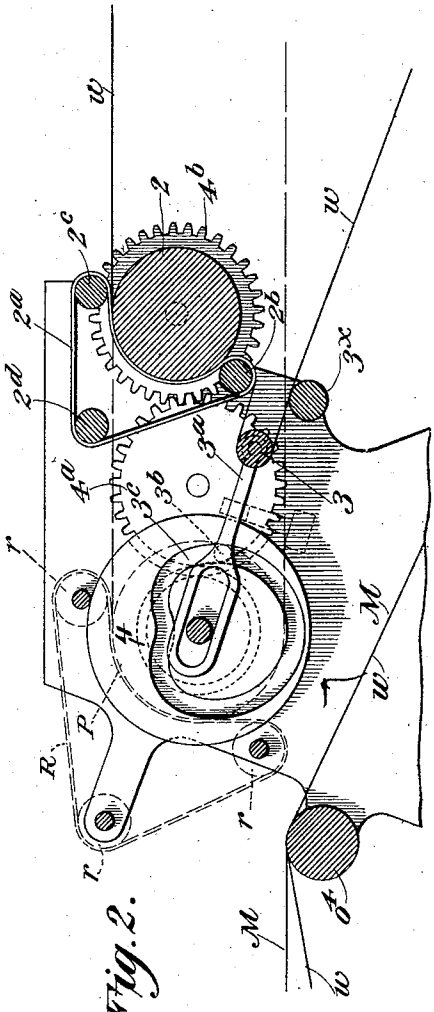

Fig. 2.

Witnesses

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## PRINTING-PRESS.

No. 880,281. Specification of Letters Patent. Patented Feb. 25, 1908.

Application filed October 5, 1907. Serial No. 396,100.

*To all whom it may concern:*

Be it known that I, PAUL FLEMMING COX, of Jackson, in the county of Jackson and State of Michigan, have invented certain new and useful Improvements in Printing-Presses; 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 printing presses of the type shown in my Patent No. 847,912, of March 19, 1907, and its object is to enable such press to produce a larger variety of papers by the employment of two webs when it is desired to print papers of two, six or ten pages. The press shown in my said patent is adapted to produce newspapers of four, eight or twelve pages, from a single web, and by the use of two webs, as hereinafter explained, it is capacitated to produce papers having six or ten pages.

The present invention, therefore, consists in means whereby a narrow web may be fed through the press and printed thereby, such narrow web being threaded in a different way and handled in a different manner from the wide web.

The invention will be clearly understood from the following description in connection with the accompanying drawings, and the parts and combination of parts for which protection is desired will be set forth in the claims.

In said drawings—Figure 1 is a sectional elevation of a press embodying the present invention. Fig. 2 is an enlarged detail view of the delivery devices for the narrow web.

As shown, the press has two oppositely reciprocating type beds B, which are operated by pitman E, connected to crank gears G, mounted on transverse shafts G′, journaled in the main frame A, and one of the gears meshing with a pinion *h* on a driving shaft H′. Above each bed is located a pair of cylinders I, I′ which are respectively adapted to operate with forms C, C′ on the outward printing strokes of the beds. The cylinders may be mounted in eccentric boxes X, which are connected to bars W, the latter being pivoted to one end of a lever V, which is pivoted on the frame and is connected by a rod U, to a lever T, pivoted on the frame and carrying a roller *t*, engaging a race cam S, on one of the gear wheels G or its shaft. By this means the bearings X will be oscillated at the proper time throwing the cylinders on or off impression.

N, is the web feed roll, and P, the delivery roll. These rolls are preferably intergeared by a train of gears *p* so as to move at the same peripheral speed. With the roll N co-acts a series of tapes Q, running over rollers *n;* and with roll P, co-acts a series of tapes R, running over a series of rollers *r*.

Customarily the main web M is led in from a roll J at one end of the machine, to the feed roll N, thence passes over a guide O, between cylinder I and bed B, at the left of the machine, over guide O′, $O^2$, then down between left-hand cylinder I′ and bed B, then up over guide $O^3$, back over guide $O^4$, down between right-hand cylinder I and bed B, and up over guide $O^5$, $O^6$, down between right-hand cylinder I′ and bed B, then up over guide $O^7$, to the delivery P.

As described in my said patent, the cylinders I, I′, print simultaneously on the web, but on different portions thereof, being arranged in this manner so as to shorten the travel of the beds. Thus, although each bed B only travels say—seventeen and one-half inches, (less margins), during impression, the two cylinders I, I′, will print twice that much web, or say—thirty-five inches of web during each printing stroke of the bed. To enable this to be done the web is so fed that the cylinder I′, prints portions of the web skipped by cylinder I, and therefore, in order to enable this to be done, seventeen and one-half inches of web, (less margins), must be fed during the taking of impressions, and the remainder seventeen and one-half inches of web, (plus margins), must be fed after impressions, or during the return strokes of the bed, while the cylinders are off impression.

As the beds are operated in the present instance by a crank movement it is necessary that the web be fed, during the taking of impressions, at a variable speed uniform with the crank movement of the bed. This may be accomplished in various ways as described in my aforesaid patent. In the present instance I have illustrated irregular gears for operating the feed roll N at a peripheral speed conformable to the crank movement of the bed during the taking of impressions, so

as to feed the desired amount of web during the taking of impressions and to feed a similar length of web after the taking of impressions. The said irregular gear feed movement forms the subject matter of a companion application for continuous variable web feeding mechanism, filed October 4, 1907, Serial No. 395,944, and therefore is not claimed specifically herein.

As shown, an irregular gear Y is fast to the roll N, and meshes with a similar irregular gear Z, fast on the shaft G′, or one of the adjacent crank gears G. The gears Y, Z, are of such outline that they will cause the periphery of roll N to move in exact uniformity with the travel of the beds B during the actual taking of impressions, and thus to feed the necessary amount of web with the bed; and when the impression is thrown off, the gears Y, Z, will continue to operate the roll N, at such speed that during the remainder of its operation an additional similar length of web may be fed between the beds and cylinders. Thus the roll N can be operated continuously at a variable speed and feed the web forward in the desired manner at all times, dispensing with the necessity of any looping or compensating rollers between the feed and delivery mechanisms.

The delivery roll P, being geared to the roll N, can be driven at the same peripheral speed as the roll N, and will properly take care of the web fed into the press.

When printing four, eight or twelve pages, a single web is used. If it is desired to print in such a press a six or ten page paper, a narrow or "pup" web *w*, is threaded through the press beside the other web M; the "pup" web being only a single page wide, while the web M is two or four pages wide. This "pup" web *w* as shown, is led in to roll N, then passes over roll O, down between left-hand cylinder I and bed B, under and over roll O′, then back directly to and over roll $O^4$, then down between the right-hand cylinder I and bed B, then up over the roll $O^5$, being in this manner printed on one side by the left-hand bed and cylinder I, and being perfected on the other side by the right-hand cylinder I and bed B. From roll $O^5$ the "pup" web passes to the delivery.

As shown, I provide an auxiliary delivery mechanism for this "pup" web, located beside the roll P, and comprising a roll 2, which is driven by gears $4^b$, $4^a$, from a gear 4, on shaft of roll P. These gears being such that roll 2, has about one-half the peripheral speed of roll P, as the "pup" web is only fed through the press during the printing operation.

The "pup" web passes around roll N, but the tapes Q, which engage the "pup" web *w* should be slackened so as to only coax but not actually feed the "pup" web forward until the delivery begins to pull on the web *w* and it is nipped between the forms on the beds and the impression cylinders I. As the "pup" delivery preferably acts continuously I provide means for looping the pup web between roller $O^5$ and its delivery roll 2. Thus as shown, the web *w* after passing roller $O^5$ may be led over a guide $3^\times$, then over a looping roller 3, then back under guide $2^b$, to the roll 2, with which co-act tapes $2^a$, which pass over roller $2^b$, and guides $2^d$ $2^c$.

The looping roller 3, may be operated so as to take up the "pup" web as it is fed forward during impression by means of a bar $3^a$, to which roller 3 is attached, and which bar is provided with a roller $3^b$, engaging a race cam $3^c$ secured to the shaft of roll P. Said cam being so shaped that the moment before the beginning of an impression the roller 3 begins to take up a loop in web *w* and in conjunction with the "pup" delivery and the beds and cylinders, draws the web *w* forward over roll $O^5$, as fast as it is printed. At the end of the printing operation, roller 3 is moved so that it gradually gives up this loop as demanded by the "pup" delivery roll 2. Thus the "pup" sheets can be delivered to the folder simultaneously with the main sheets.

The foregoing explanation and the drawings will impart a sufficiently clear understanding of the invention and its mode of operation,—but the means for feeding and delivering the "pup" web may of course be varied; that shown herein being the present preferred mode of handling such web. It will be observed that the "pup" web *w*, does not follow the path of the web M, except as far as the roll O′, then it separates from web M, and passes directly to roller $O^4$, at which point it again meets web M, and passes therewith as far as roll $O^5$, where it again separates therefrom and passes direct to the delivery. Also the "pup" web *w* is printed by only one cylinder in each pair, whereas the main web M passes successively between both cylinders in each pair and their bed. The "pup" web *w* therefore does not have to be fed after impressions, while the main web M must be fed after impressions.

Having described my invention what I desire to secure by Letters Patent is:

1. In a web printing press, the combination of a reciprocating type bed, a cylinder co-acting therewith and means for feeding two webs between the bed and cylinder in unison with the movement of the bed during the taking of impressions and at different speeds after the taking of impressions.

2. In a web printing press, the combination of a pair of movable beds, cylinders co-acting therewith, and means for feeding two webs between the beds and cylinders to be perfected thereby, the webs being fed in unison with the movements of the type beds

during impressions and at different speeds after impressions.

3. In a web printing press, the combination of a reciprocating bed, a cylinder co-acting therewith and means for feeding two webs between the bed and cylinder and in unison with the movement of the bed during impressions, and for additionally feeding one of said webs between the bed and cylinder while the impression is thrown off.

4. In a web printing press, the combination of a pair of movable beds, cylinders co-acting therewith, means for feeding two webs between the beds and cylinders to be perfected thereby during the taking of impression, and for feeding an additional length of one of the webs between the beds and cylinders while the impression is thrown off.

5. In a web printing press, the combination of a reciprocating type bed, a pair of cylinders co-acting therewith, means for feeding a web successively between both cylinders and bed, and means for feeding a second web between one of the cylinders and the bed the webs being fed in unison with the movements of the type bed during impressions.

6. In a web printing press, the combination of a reciprocating type bed, a pair of cylinders co-acting therewith, means for feeding a web between both cylinders and bed both during and after the taking of impressions, and means for feeding a second web between one of the cylinders and bed during the taking of impressions.

7. In a web printing press, the combination of a pair of reciprocating beds, impression cylinders co-acting with each bed, means for feeding a web of paper continuously between the cylinders and beds; with means for intermittently feeding a second web between the beds and cylinders.

8. In a web printing press, the combination of a pair of movable beds, two impression cylinders co-acting with each bed, means for directing a web of paper successively between the cylinders in one pair and their bed, and then successively between the cylinders of the other pair and their bed; with means for directing a second web between one cylinder in one pair and its bed and then between one cylinder in the other pair and its bed.

9. In a web printing press, the combination of a pair of oppositely movable beds, two impression cylinders co-acting with each bed, means for continuously feeding a web of paper successively between the cylinders in one pair and their bed to be printed on one side, and then successively between the cylinders of the other pair and their bed to be printed on the opposite side; with means for intermittently feeding a second web between one cylinder in one pair and its bed and then between one cylinder in the other pair and its bed.

10. In a web printing press, the combination of a pair of movable beds, two impression cylinders co-acting with each bed, means for directing a web of paper successively between the cylinders in one pair and their bed, and then successively between the cylinders of the other pair and their bed, and means for directing a second web between one cylinder in one pair and its bed and then between one cylinder in the other pair and its bed; with means for feeding the first web continuously between the beds and cylinders both during and after the taking of impression, and means for feeding the second web between the beds and cylinders only during the taking of impression.

11. In a printing press, the combination of a pair of movable beds, cylinders above and co-acting with each bed, means for directing a web successively between the beds and cylinders, means for feeding a length of web between the beds and cylinders during impressions and for feeding a corresponding length of web between the beds and cylinders after impressions, means for directing a second web between the cylinders and bed, and means for feeding this second web only during impressions.

12. In a web printing press, the combination of a pair of reciprocating beds, impression cylinders co-acting with each bed, means for feeding a web of paper continuously between the cylinders and beds; with means for intermittently feeding a second web between the beds and cylinders comprising a continuously operating delivery roll and a looping roll co-acting therewith to draw the web forward during the taking of impressions and let it rest after the taking of impressions.

13. In a printing press, the combination of a pair of movable beds, a pair of cylinders above and co-acting with each bed, means for directing a web successively between the beds and cylinders in each pair, and means for feeding a length of web between the beds and cylinders during impressions and for feeding a corresponding length of web between the beds and cylinders after impressions; means for directing a second web between one cylinder in each pair and its co-acting bed and means for feeding this web between the beds and cylinders only during impressions.

14. In a printing press, the combination of a pair of movable beds, a pair of cylinders above and co-acting with each bed, means for directing a web successively between the beds and cylinders in each pair, and means for feeding a length of web between the beds and cylinders during impressions and for feeding a corresponding length of web between the beds and cylinders after impressions; means for directing a second web between one cylinder in each pair and its co-acting bed, and means for feeding this web between the

beds and cylinders only during impressions, comprising a continuously operating delivery roll and a looping roll co-acting therewith to draw the web forward during the taking of impressions and let it rest after the taking of impressions.

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

PAUL FLEMMING COX.

Witnesses:
JAMES R. MANSFIELD,
GEO. M. BOND.