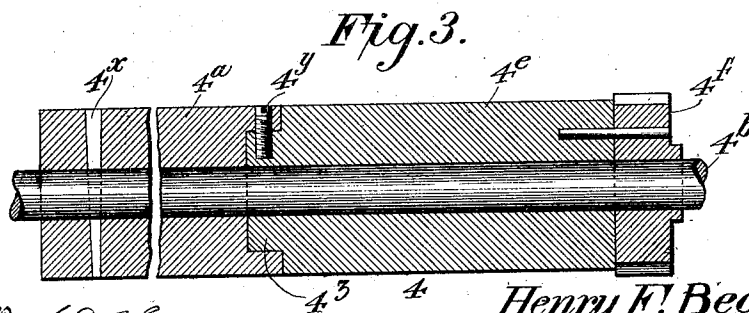
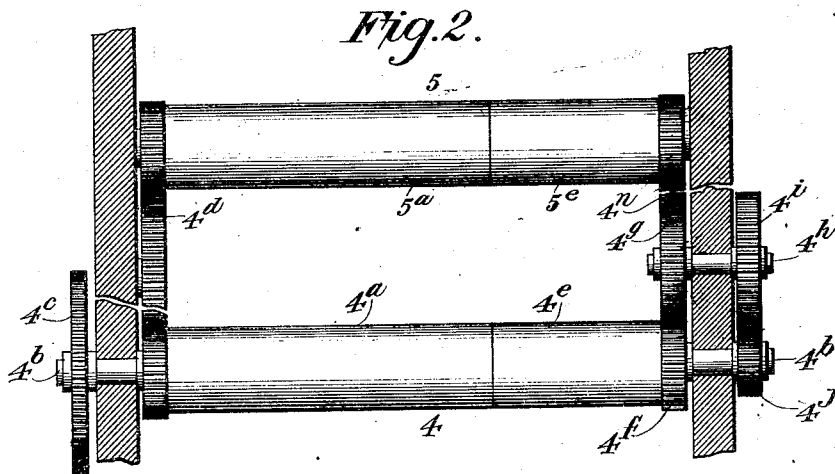
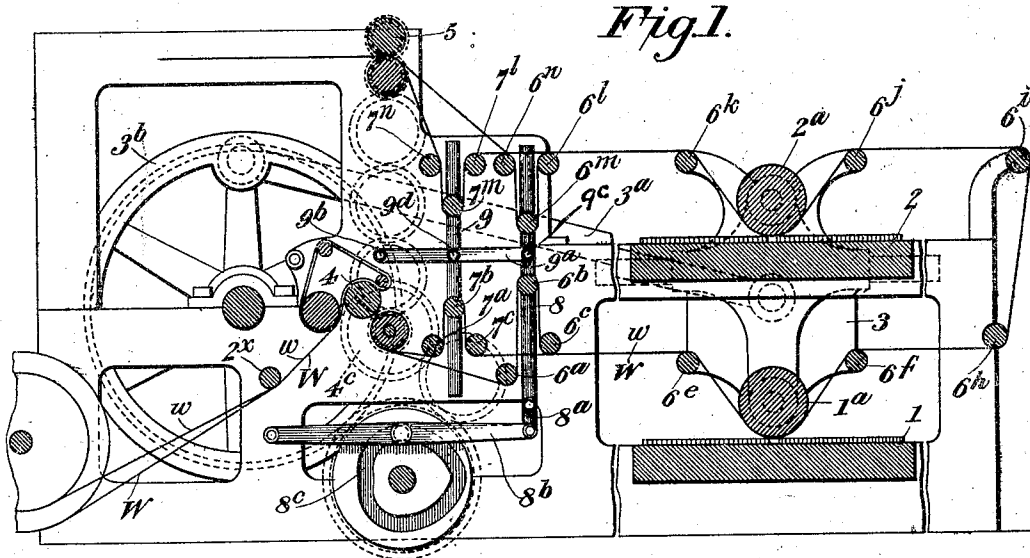


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PATENTED JUNE 2, 1908.

H. F. BECHMAN.
WEB FEEDING ROLLS.
APPLICATION FILED AUG. 30, 1907.



Inventor:

Witnesses

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UNITED STATES PATENT OFFICE.

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WEB-FEEDING ROLLS.

No. 889,746.

Specification of Letters Patent.

Patented June 2, 1908.

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To all whom it may concern:

Be it known that I, HENRY F. BECHMAN, of Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Web-Feeding Rolls; 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 feeding rolls, particularly designed for use in web printing presses of the well-known "duplex" type, although applicable to other kinds of presses and machines. Its object is to enable two webs to be fed through the printing mechanisms at different speeds, so that both webs may be printed from different forms by the same printing couples, different lengths of each web being printed at each operation of the press, and each web being fed through the press at a predetermined speed and thereafter the products of the two webs can be assembled together.

As applied to printing presses of the duplex type, for example, if the cylinders have a travel sufficient to cover two rows of forms arranged one after the other upon the bed, impressions can be taken on one web from forms thus arranged and impressions can be taken on the other web from a single form placed on the same bed. Thus eight or twelve pages could be printed simultaneously on one web by using a double row of forms on each bed, and at the same time two pages could be printed upon the narrow web by the same beds and cylinders from single page forms placed on the beds. This would necessitate feeding the wide web through the press at about twice the speed of the narrow web.

This invention provides novel web feeding rolls whereby the two webs can be fed and delivered at the necessary speed.

The invention in brief consists in making the web-feeding and delivering cylinders in two sections and providing gearing whereby the shorter sections of the cylinders, which handle the narrow web, can be run at lower speed than the longer sections thereof, which handle the wide web, so that the narrow web can be fed at the desired slow speed relative to the wide web.

I will now describe the invention with

reference to the machine illustrated in the accompanying drawing—in which—

Figure 1 represents diagrammatically a duplex press equipped with my novel feeding and delivering rolls. Fig. 2 is an enlarged sectional view illustrating the construction and mode of gearing the sectional feeding and delivering rolls, whereby two webs may be fed through the press at different speeds. Fig. 3 is a detail view of one of the sectional rolls showing one way in which the roll sections may be locked together.

In the drawings 1 and 2 are type beds adapted to carry two rows of type forms, as indicated; 1^a, and 2^a, are the cylinders, co-acting with the forms on said beds. Said cylinders may be mounted in sliding carriers 3, reciprocated back and forth by means of connecting rods 3^a operated by crank wheels 3^b, as in the "duplex" press. The beds and cylinders are preferably arranged as in the ordinary duplex press, and require no detailed description herein as the construction is well understood.

The feeding-in devices 4 and delivery devices 5 are arranged substantially as in the duplex press, and the guides and looping devices for handling the main web are arranged substantially as in the duplex press and need no detailed description; but will be readily understood by following the course of what I shall term herein the "wide web" indicated at W in the drawings. This web W is led in under a guide 2^x and between the feed rolls 4 down under the guide 6^a, up over looping roller 6^b, down under a guide 6^c, to and over guide 6^d, then between bed 1 and cylinder 1^a, up over guide 6^e, back to, under and over guides 6^a, 6^b, back over guide 6^d between cylinder 2^a and bed 2; thence over guide 6^b to guide 6^e, then down under looping roller 6^m, then up over guide 6ⁿ to the delivery rolls 5. The guides 6^a, 6^b, 6^c, 6^d, 6^e, are mounted on the cylinder carriers and travel with the cylinder. The looping rollers 6^b and 6^m are mounted in a reciprocating frame 8, which is operated by means of a link 8^a connected to a lever 8^b, which is vibrated by means of cam 8^c, as in the duplex press; the parts being operated in such manner that during the taking of an impression, while the cylinders 1^a, 2^a, are rolling over the type forms, the web fed

in by the feeding rollers is taken up by the ascent of looping roller 6^b, while a like amount of web is given out by the ascent of the looping roller 6^m, so that the in-feed and out-feed of the web is continuous, as in the duplex press, and between impressions the looping rollers are lowered so that the loop of web formed over roller 6^b is transferred to the looping roller 6^m and enough of the web is shifted forward between the beds and cylinders to bring unprinted portions of the web into position to be printed at the next movement of the cylinders over the forms. The web *w*, which I will call the "slow web", is guided similarly through the press but is operated at say half the speed of web *W*. In order to feed and deliver this web *w* at half speed I make the feed and delivery rolls 4 and 5 in sections, as indicated in Figs. 2 and 3; the fast section 4^a of roll 4 is fixed to the shaft 4^b which is driven by a suitable train of gears 4^e from the drive shaft, at the proper speed to feed the web *W* into the press with the desired rapidity.

The slow section 4^e of the feed roll 4 is preferably rotatably mounted on shaft 4^b and is driven, at say half the speed of section 4^a, by means of the pinion 4ⁱ fast on section 4^e meshing with a pinion 4^s on a stub shaft 4^h journaled in the frame and carrying a gear 4ⁱ meshing with a gear 4^j keyed on the shaft 4^b, so that the slow section 4^e is driven from shaft 4^b at a speed different from that of section 4^a. The delivery roll 5 is similarly constructed with fast and slow sections 5^a, 5^e, which are driven, at the same speed as the sections 4^a, 4^e, of the in-feed roll, by means of trains of gears 4^d and 4ⁿ, as indicated in Fig. 2 of the drawing.

By properly proportioning or varying the diameters of gears 4ⁱ, 4^j, any desired difference between the peripheral speeds of sections 4^a, 4^e, can be obtained; and where a full width web is to be printed, the sections may be driven at the same speed by substituting suitably proportioned gears for the gears 4ⁱ, 4^j. Or by removing gear 4^s and locking sections 4^e, 5^e, respectively to the sections 4^a, 5^a, or their shafts.

The arrangement of forms for printing any even number of pages on one web will be obvious to pressmen and need not be described herein. When a full width web is to be printed to produce say 16 pages, the gears 4ⁱ, 4^j, can be changed so that the slow sections 4^e, 5^e, will be driven at the same speed as the sections 4^a, 5^a, and then the wide web is led through the press like web *W* above described, and the looping rollers 7^a, 7^m, will not be used.

If it be desired to handle a wide web through the press at slow speed, it will only be necessary to alter the gearing so as to drive both sections at the slow speed. Or if

desired in order to drive sections 4^a, 5^a, at slow speed, like sections 4^e, 5^e, the section 4^a, can be unlocked from its shaft 4^b by withdrawing the key 4^x, and locked to section 4^e in any desired manner, as for instance by a screw 4^y engaging a shoulder 4^z on section 4^e, as indicated in Fig. 3. Section roll 5 could be similarly constructed. This being merely a matter of mechanical selection and construction I do not wish to be restricted to any particular construction whereby the two sections of rolls 4 and 5 may be driven alike, at either fast or slow speed. When the sections are driven alike at slow speed, a wide web can be led through the press like web *w* and looping rollers 6^b, 6^m, will not be used. Thus I can run through this press a single wide web at slow or fast speed; or two narrow webs at different speeds.

Assuming that two webs are to be printed, and that the slow sections 4^e, 5^e, are geared at half the speed of the fast sections 4^a, 5^a, so as to feed the narrow web *w* one-half as fast as the wide web *W*, it is necessary to provide means for looping the web *w* in accordance with its slower in-feed and delivery. A very simple and effective way of looping this web is indicated in the drawings. As shown, web *w* passes from a roll under guide 2^x to and over the slow in-feed section 4^e, and thence under a fixed guide 7^a over a looping roller 7^b, down under guide 7^e, and thence over the guide 6^e beside and along with the wide web *W* to and between the beds and cylinders and on as far as guide 6^k; then the narrow web *w* passes over a guide 7ⁱ, down under a looping roller 7^m, up over a guide 7ⁿ to the slow feed section 5^e of the delivery mechanism. The looping rollers 7^b and 7^m are mounted in a frame 9, which is pivotally connected at 9^d to a lever 9^a, which is pivoted at 9^b to a fixed point of the frame and its forward free end is pivoted at 9^c to the frame 8, as shown. The pivot 9^d is midway between the pivots 9^b and 9^c and therefore the frame 9 will be moved by and with the frame 8 but will only move half the distance traveled by frame 8, consequently the looping rollers 7^b, 7^m, will only move half the distance of the looping rollers 6^b, 6^m, and at half the speed of the latter, and thus the web *w* will be looped exactly in accordance with its feed and delivery, and the one set of looping cams 8^e will care for both sets of loopers.

The invention is applicable to other constructions of presses than that shown in the drawings and also to other kinds of web manipulating machinery.

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

1. In a web printing press, the combination of a roll having two sections, one of said sections being fast to the roll shaft and the

other loose thereon, means for driving said shaft, a gear on said shaft beside the loose section, and changeable gearing between such gear and the loose section whereby the latter is driven from the shaft of the roll at a different speed.

2. In a web printing press, the combination of a web feeding roll, and a web delivery roll each having a plurality of sections, means whereby the sections of the feed roll may be driven at the same or at different

speeds and gearing between the respective sections of the feed roll and the similar sections of the delivery roll.

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

HENRY F. BECHMAN.

Witnesses:

F. W. DUNNING,

ARTHUR E. DOWELL.