

July 29, 1958

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2,845,021

WEB FEED MEANS FOR ROTARY PRINTING PRESS

Filed March 28, 1955

3 Sheets-Sheet 1

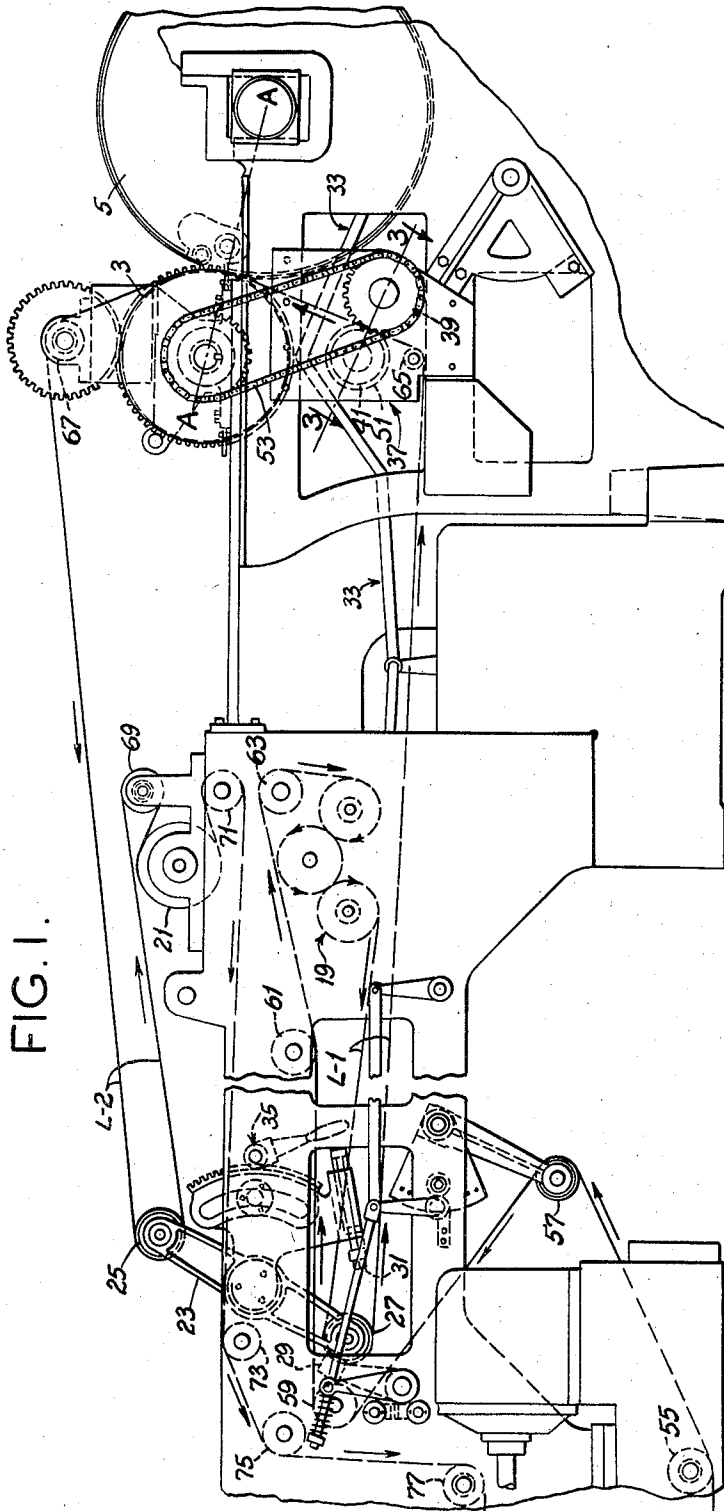


FIG. 1.

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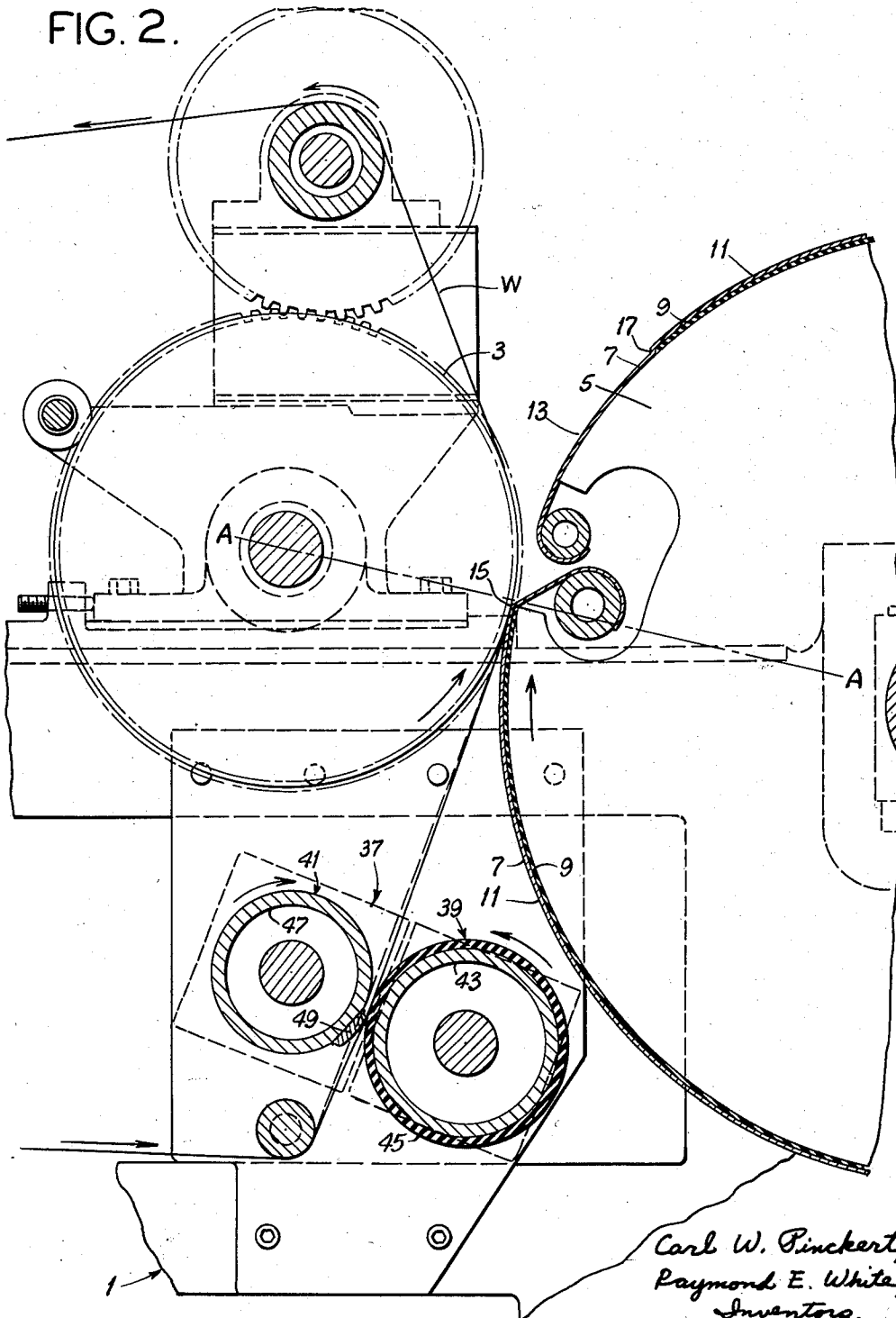
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FIG. 2.



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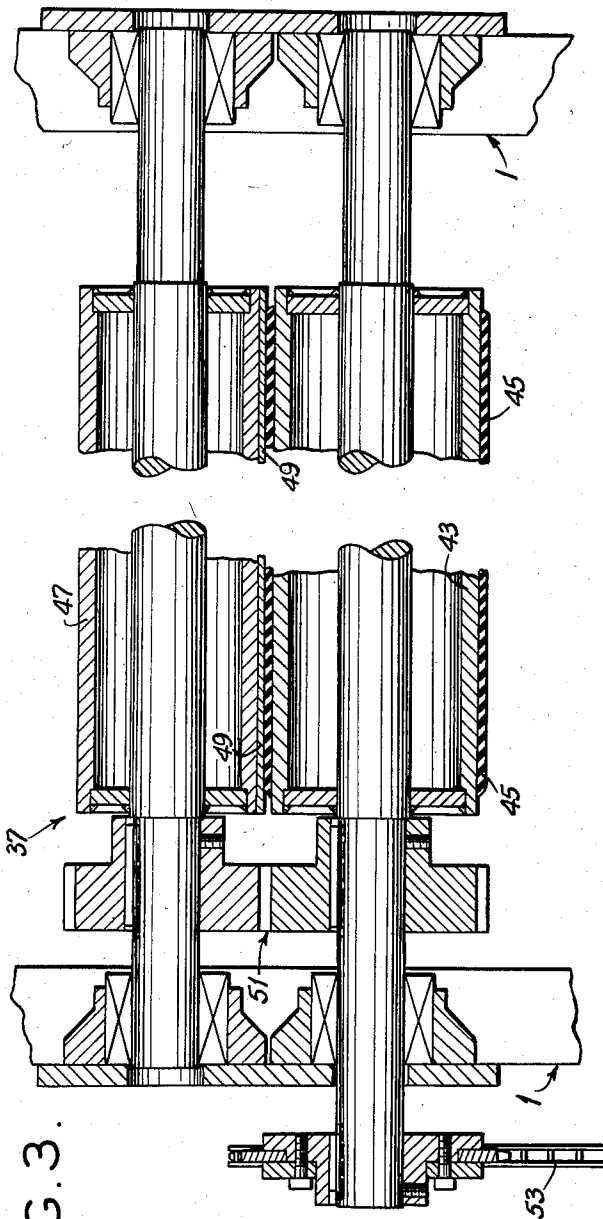


FIG. 3.

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WEB FEED MEANS FOR ROTARY PRINTING PRESS

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Application March 28, 1955, Serial No. 497,192

3 Claims. (Cl. 101—228)

This invention relates to printing presses, and more particularly to rotary presses for printing impressions on a continuous web.

The invention is specifically concerned with presses of the type having a printing couple which intermittently resiliently grips and then releases the web. One such type of press is an offset press in which the couple is constituted by an impression cylinder and a blanket cylinder, wherein rubber underlays are used under the blankets on the blanket cylinder. In such a couple, the amount of web fed forward each time the web is gripped in the couple exceeds the impression length, and, unless compensation is made for this excess, it is impossible to operate without having unprinted spaces between the impressions on the web. Among the several objects of this invention may be noted the provision of improved and simplified means compensating for the excess of material fed forward each time the web is gripped in the couple to enable printing without any unprinted space or with less unprinted space than heretofore possible between the impressions on the web; the provision of such means which is continuously driven and acts on each cycle of the couple to feed the web backwards a distance corresponding to the stated excess; and the provision of means of the class which is economical to provide and reliable in operation. Other objects and features will be in part apparent and in part pointed out hereinafter.

The invention accordingly comprises the constructions hereinafter described, the scope of the invention being indicated in the following claims.

In the accompanying drawings, in which one of various possible embodiments of the invention is illustrated, Fig. 1 is a side elevation of a press equipped with means of this invention;

Fig. 2 is an enlarged vertical section showing the impression cylinder and blanket cylinder of the press, and the feedback means of this invention; and

Fig. 3 is an enlarged section taken on line 3—3 of Fig. 1.

Corresponding reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to the drawings, reference character 1 generally designates a rotary offset press for printing impressions on a web W. The press 1 is similar to that shown in U. S. Patent 1,978,073. It has a printing couple constituted by an impression cylinder 3 and a blanket cylinder 5. The blanket cylinder 5 has two blankets 7. Each blanket 7 extends around somewhat less than half the circumference of the blanket cylinder. For each blanket 7 there is a rubber underlay 9, providing two raised portions 11 on the blanket cylinder. Between the ends of the raised portions 11 there are gaps, one of which is indicated at 13 in Fig. 2. The cylinder defined by the surfaces of raised portions 11 of the blanket cylinder 5, instead of being tangent to the impression cylinder 3, intersects the impression cylinder 3. On each revolution of the impression cylinder, the web

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is resiliently gripped between one or the other of the raised portions 11 and the impression cylinder, and fed forward at the surface speed of the cylinders 3 and 5. Following each such feeding operation (during which an impression is printed on the web), the web is released for the interval during which one or the other of the gaps 13 is adjacent the impression cylinder.

Thus, the web W is intermittently gripped and fed forwards by the couple constituted by cylinders 3 and 5 and then released for an interval upon each cycle of the couple (each revolution of the impression cylinder in the case of the press herein disclosed). The leading edge 15 of each raised portion 11 of the blanket cylinder 5 comes into engagement with and grips the web against the impression cylinder 3 somewhat before the edge 15 reaches the plane A—A (see Fig. 2) of the axes of the impression and blanket cylinders, and the trailing edge 17 of each raised portion 11 passes out of gripping engagement with the web somewhat after the edge 17 passes this plane. The result is that an excess of web is fed forward on each feed portion of the cycle of the couple. This excess may be of the order of one and one-half inches, for example, for some presses.

As will be understood in the art, a press of the type herein disclosed has web feed means as indicated at 19 and 21 which function to feed the web forward (the direction of the arrows in Figs. 1 and 2) at a constant speed. For the press shown herein, this speed is less than the speed at which the web is fed forward when gripped in the printing couple constituted by cylinders 3 and 5. It will be understood, however, that the principles of the present invention are also applicable to a press of the type shown in U. S. Patent 2,546,372, in which the feed rolls may feed the web at a speed lower than, the same as, or higher than the speed of the couple. The press herein disclosed also has a compensator comprising a pivoted web tensioning frame 23 having upper and lower guide rolls 25 and 27. Stops for limiting the swing of the frame are indicated at 29 and 31. The stops at 29 are also kickers, being operated by a cam (not shown) on the blanket cylinder through a linkage 33. The stops at 31 are adjustable by means indicated at 35.

In accordance with this invention, the press is provided with web feeding means generally designated 37 operating in timed relation to the couple (cylinders 3 and 5) for feeding the web backwards during the intervals in which the web is released by the couple an amount corresponding to the excess of web fed forward on the feed portion of the cycle of the couple. The feed-back means 37 is shown as located rearward of the couple with respect to the direction of web travel. It comprises a pair of intermittent-grip feed rolls 39 and 41 adapted intermittently to grip the web and feed it backwards. More particularly, the roll 39 comprises a steel tube 43 having a rubber cover 45. The roll 41 comprises a steel tube 47 having a bar 49 welded thereon extending from one end of the tube to the other. The bar 49 presents a raised surface for intermittent engagement with the rubber-covered roll 39. The rolls 39 and 41 are geared together as indicated at 51 in Fig. 3. Roll 39 is driven from the impression cylinder by a chain and sprocket drive 53. Roll 41 is phased so that the bar 49 engages and grips the web during the intervals when the web is released by the couple.

The web travels over rolls 55, 57, 59, 61 and 63 to the feed means 19 (which consists of three feed rolls as shown). From the feed means 19 the web travels in a loop L-1 around the lower roll 27 of the frame 23. From the roll 27 the web travels to a roll 65, and thence passes between the feed-back rolls 39 and 41 to the couple 3, 5. Leaving the couple, the web travels around a roll 67 and thence in a loop L-2 around the upper roll 25 of frame

23. From the roll 25, the web travels around a roll 69 to the upper feed means 21 (which consists of a single roll). From the feed means 21, the web travels over rolls 71, 73, 75 and 77 as shown. The frame 23 normally occupies the position shown in Fig. 1. When the web is gripped and fed forward by the printing couple faster than the speed of the feed means 19 and 21, the tension in the loop L-1 increases, and the frame 23 swings counterclockwise as viewed in Fig. 1. The increased rate of feed tends to put slack into the loop L-2, but this is taken up by the upper roll 25 as it moves to the left as shown in Fig. 1 upon counterclockwise swinging of the frame 23. When the web is released from being gripped in the couple 3, 5 the frame 23 swings back to its normal position shown in Fig. 1. The feedback of the web by rolls 39 and 41 occurs before the frame 23 has completed its return to normal position, so that the frame takes up the slack in the loop L-1 which would otherwise occur because of the feed-back.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As various changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

We claim:

1. In a web printing press having a printing couple operable in cycles in each of which the web is intermittently gripped and fed forward for an interval and then released for another interval, an excess of web being fed forward each time the web is gripped, and means for driving the couple for operation thereof to feed the web forward during the one interval and for releasing the web during the other interval of the cycle, that improvement which comprises the provision of a pair of intermittent-grip web feed rolls, one of said rolls having a raised surface portion extending longitudinally thereof adapted upon rotation of the rolls for intermittent engagement with the other roll, and means for continuously driving said feed rolls from the press in the direction for feeding the web backwards an amount corresponding to said excess upon each engagement of said raised surface portion of said one roll with the other, said feed roll driving means being correlated with the driving means for the couple in such manner that said engagement occurs during the intervals in which the web is released.

2. In a web printing rotary offset press having an impression cylinder and a blanket cylinder adapted upon rotation thereof to intermittently resiliently grip the web and feed it forward for an interval and then release the

web for another interval during each revolution of the impression cylinder, an excess of web being fed forward each time the web is gripped, and means for driving the cylinders for operation thereof to feed the web forward during the one interval and for releasing the web during the other interval of each revolution of the impression cylinder, that improvement which comprises the provision of a pair of intermittent-grip web feed rolls, one of said rolls having a raised surface portion extending longitudinally thereof adapted upon rotation of the rolls for intermittent engagement with the other roll, and means for continuously driving said feed rolls from the press in the direction for feeding the web backwards an amount corresponding to said excess upon each engagement of said raised surface portion of said one roll with the other, said feed roll driving means being correlated with the driving means for the impression and blanket cylinders in such manner that said engagement occurs during the intervals in which the web is released from the impression and blanket cylinders.

3. In a web printing rotary offset press having an impression cylinder and a blanket cylinder adapted upon rotation thereof to intermittently resiliently grip the web and feed it forward for an interval and then release the web for another interval during each revolution of the impression cylinder, an excess of web being fed forward each time the web is gripped, and means for driving the cylinders for operation thereof to feed the web forward during the one interval and for releasing the web during the other interval of each revolution of the impression cylinder, that improvement which comprises the provision of a pair of intermittent-grip web feed rolls located rearward of the impression and blanket cylinders with respect to the direction of web travel, one of said rolls having a raised surface portion extending longitudinally thereof adapted upon rotation of the rolls for intermittent engagement with the other roll, the other roll having a resilient surface, and means for continuously driving said feed rolls from the press in the direction for feeding the web backwards an amount corresponding to said excess upon each engagement of said raised surface portion of said one roll with the other, said feed roll driving means being correlated with the driving means for the impression and blanket cylinders in such manner that said engagement occurs during the intervals in which the web is released from the impression and blanket cylinders.

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