Nov. 18, 1924. 1,515,791

C. R. REDNER

PRINTING PRESS

Filed Oct. 4, 1923 2 Sheets-Sheet 1

Fig. 1

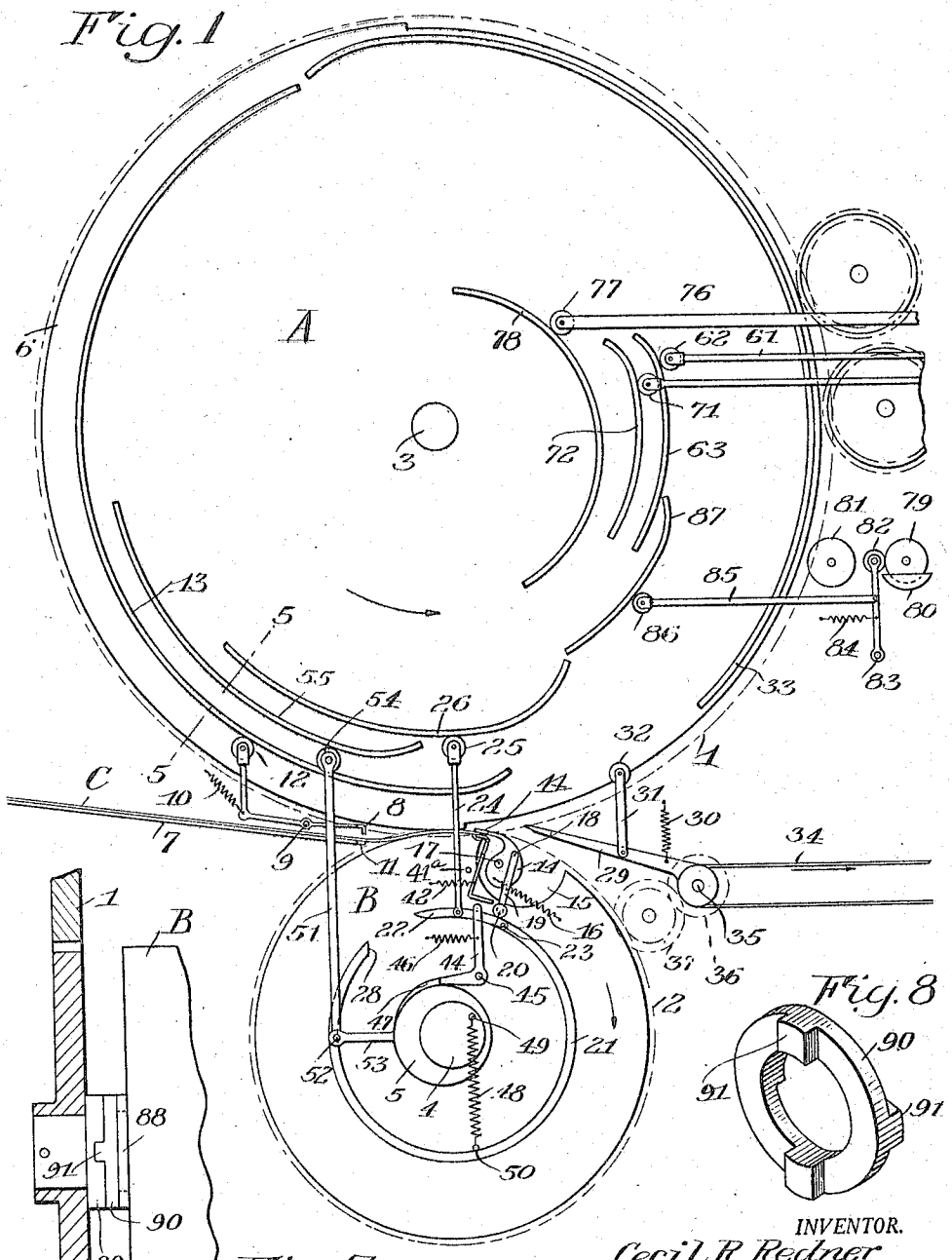

Fig. 7

Fig. 8

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Fig. 2

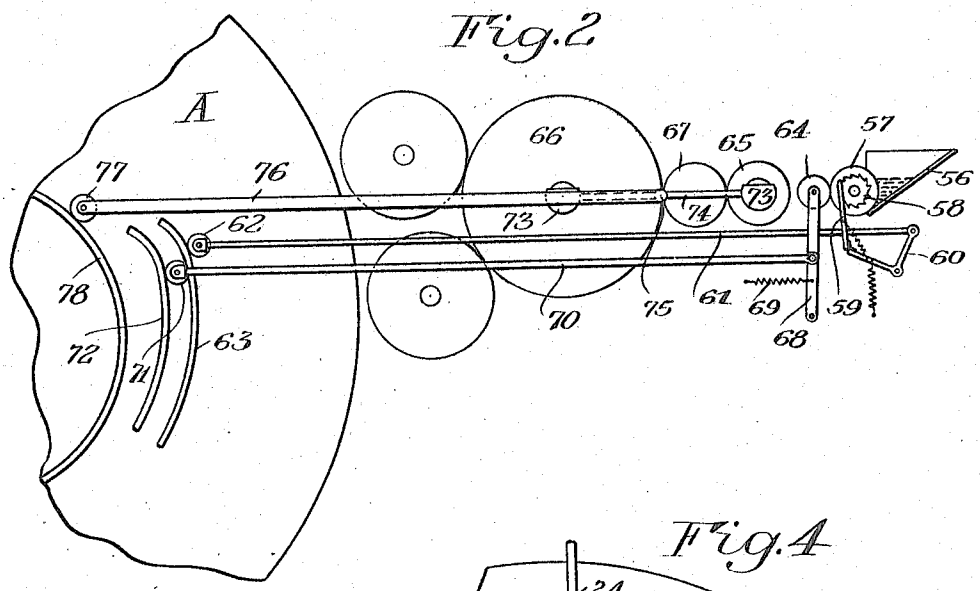


Fig. 3

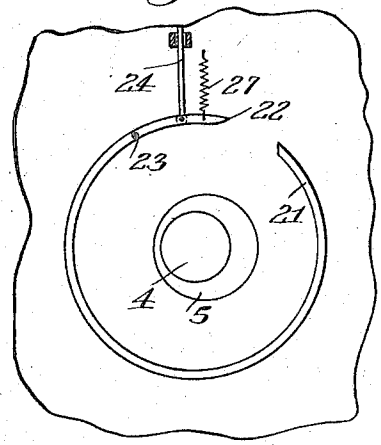


Fig. 4

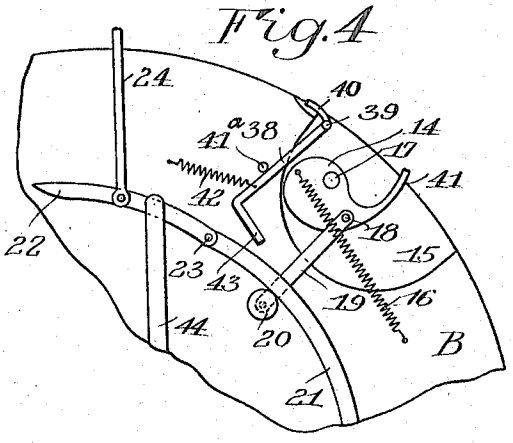


Fig. 5

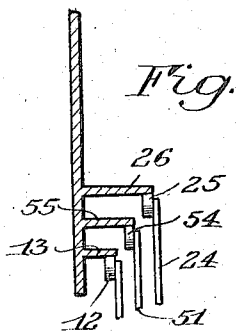
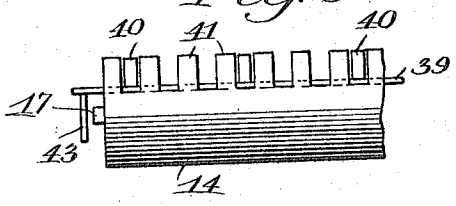


Fig. 6



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Patented Nov. 18, 1924. 1,515,791

UNITED STATES PATENT OFFICE.

CECIL R. REDNER, OF ROCHESTER, NEW YORK.

PRINTING PRESS.

Application filed October 4, 1923. Serial No. 666,598.

To all whom it may concern:

Be it known that I, CECIL R. REDNER, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Printing Presses; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference numerals marked thereon.

My present invention relates to printing and more particularly to printing presses and it has for its object to provide a machine of this character and of the rotary type that will combine the facilities of a rotary press and a reciprocating bed press and be capable of ordinary printing, color work, duplicating and such operations as are not ordinarily performed on a single press. My improvements are directed in part toward arrangements whereby auxiliary mechanisms are all controlled from the type roll and toward the mechanism for gripping and stripping the paper. To these and other ends the invention resides in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Figure 1 is a side view of a rotary printing press constructed in accordance with and illustrating one embodiment of my invention, portions of the inking and feeding mechanisms being broken away.

Figure 2 is a side view of a fragment of the type roll and the inking mechanism.

Figure 3 is an elevation of the gripper cam for the impression roll viewed from the inside of the frame.

Figure 4 is an enlarged fragmentary elevation of the gripper mechanism.

Figure 5 is an enlarged detail section on the line 5—5 of Figure 1.

Figure 6 is a fragmentary plan view of the gripper.

Figure 7 is a fragmentary view partly in section of the coupling between the type cylinder and the impression cylinder and

Figure 8 is an enlarged perspective view of an element of said gearing.

Similar reference numerals throughout the several views indicate the same parts.

Referring more particularly to the drawings A indicates the type cylinder and B the impression roll which are geared together as indicated by the dotted lines 1 and 2 to work in unison. The type cylinder is mounted on a shaft 3 and the impression roll turns on a shaft 4 carried by eccentric supports 5 so that the impression roll may be carried toward and from the type roll into and out of printing contact through the operation of devices hereinafter described. The raised contact surface 6 of the type cylinder equals half of its circumference and the type cylinder makes two revolutions of the impression roll while making one revolution of its own. In this way, the impression roll makes one revolution in contact with the type roll while the impression is being made. During the next revolution of the impression roll the roll is out of contact with the type cylinder.

The sheets C to be printed upon are fed from a table 7 under the control of a detent or arresting device in the present form of a finger 8 pivoted at 9 and normally held by a spring 10 in a notch 11 of the table 7 to prevent the sheet from moving into the printing couple at other than the proper moment. A roller 12 on the finger cooperates with a cam 13 on the end of the type cylinder A which cam, at the proper time, depresses the finger and releases the sheet. At this point the latter is gripped by a gripper 14 located in a cavity 15 in the impression roll B. It is adapted to grip the sheet as shown in Figure 1 along an edge of the cavity through the influence of a spring 16 connected to it below its pivot 17. Above its pivot or turning center there is pivoted to it at 18 a link 19 terminating in a roller 20 that cooperates with a cam ring 21 suitably fixed stationarily to the frame of the machine. The point 22 of the cam 21 is pivoted at 23 to be raised and lowered by a link 24 terminating at its upper end in a roller 25 adapted to be engaged by a cam 26 also on the end of the type cylinder A. A spring 27 tends to hold the cam point 22 raised as in Figure 3.

Assuming the parts of the gripper mechanism to be in the positions of Figure 4, the jaw 14 is held open by its link roller 20 travelling on the inside of the fixed cam ring 21. During this revolution of the impression roll it is passing the blank portion of the type roll A. When the roller 20 reaches the end 28 and the spring 16 is no longer restrained, the gripper 14 engages the edge of

a sheet which has just previously been released by the finger 8. The cam 26 immediately depresses the movable cam point 22 and the roller 20 rides outside of the cam ring 21 during a revolution of the impression roll B during which the impression is made through contact with the type carrying portion of the the type roll A. Upon the completion of that revolution the roller 20 on the gripper again runs off of the fixed end 28 of the cam 21 and the gripper opens releasing the sheet C as at this time the link 24 is not depressed because the cam 26 is on the opposite side of its circular path. Consequently, the gripper roller 20 passes beneath the movable point 22 and takes the inside of the cam 21 on the next revolution, as in the first instance and as shown in Figure 4.

As the sheet is released by the gripper, it is picked up by a stripper 29 that is normally held raised by a spring 30 and is depressed at the proper time by a link 31 having a roller 32 at its upper end engaged by a cam 33 on the type roll A. The stripper passes the sheet on to a conveyor 34 on the roll shaft 35 of which the stripper is pivoted. This shaft also carries a gear 36 meshing with a gear 37 by which it is driven from the gear 2 on the impression roll B.

Means are provided for throwing the impression roll out of printing relationship with the type roll in case the feeding and gripping devices fail to work. A detector lever 38 pivoted at 39 in the cavity 15 has fingers 40 against which the sheet is gripped by the gripper 14 but which are interspersed with the fingers 41 of the gripper as shown in Figure 6. Consequently, if no sheet is interposed the detector finger 40 occupies the raised position of Figure 4 being held against a stop 41^a by a spring 42. This carries a foot 43 on the detector into a position in which it will engage with a bell crank detent 44 having a fixed pivot 45 on the frame. The detent under the influence of a spring 46 normally engages an abutment 47 on the eccentric support 5 of the shaft 4 and prevents it from turning under the influence of a spring 48 eccentrically connected to the shaft 4 at 49 and to the fixed frame of the machine at 50. When tripped by the detector, however, the detent is released from the abutment and the eccentric 5 is turned sufficiently by the spring 48 to throw the impression roll B out of printing contact with the type cylinder A. It is returned by a link 51 pivoted at 52 to an arm 53 on the eccentric and having a roller 54 at its upper end engaged by a cam 55 on the end of the type cylinder A.

It is convenient to use a diametric sliding connection between the driving gear of the impression cylinder and the cylinder itself to maintain a constant peripheral speed when the impression cylinder is thrown out of printing relationship with the type cylinder. I have illustrated in Figures 7 and 8 a known form of sliding clutch connection of this character embodying a slotted hub 88 on the cylinder B, a similar hub 89 on the gear 2 but slotted in a relatively transverse direction and a coupling washer 90 interposed between the two and having relatively transverse lugs 91 respectively cooperating with the slots to give the required rotary drive at the same time permitting a sliding movement transverse to the axis of rotation.

The progressively offset arrangement of the various cams on the printing cylinder whereby the actuating links do not interfere with each other is shown in section in Figure 5.

The inking mechanisms shown in Figures 1 and 2 includes in the present instance a reservoir 56 provided with an ink roll 57 having a ratchet 58 actuated by a pawl 59 connected by links 60 with a link 61 terminating in a roller 62 that is engaged by a cam 63 on the end of the type cylinder A. A doctor roll 64 is oscillated between this ink roll 57 and intermediate rolls 65 and 66 which have a reversing endwise movement on opposite sides of a fixed roll 67 to mix the ink. The doctor roll is carried on a pivoted arm 68 and moved in one direction by a spring 69 and in the other direction by a link 70 terminating in a roller 71 actuated by a cam 72 on the end of the type cylinder A. The rolls 65 and 66 are oscillated by universal joint connections 73 with the ends of the pivoted T shaped member 74 to the stem of which is pivoted at 75 a link 76 terminating in a roller 77 actuated by a cam 78 on the end of the type cylinder A, the type cylinder thus carrying all of the actuating mechanism for the different parts of the press.

A water feeding roll 79 running in a water tray 80 feeds to a distributing roll 81 through a doctor roll 82 pivoted at 83 and vibrated by means of a spring 84 and a link 85 having a roller 86 engaged by a cam 87 on the type roll A.

I claim as my invention:

1. In a printing press, the combination with rotary type and impression cylinders and paper feeding and stripping mechanism and inking mechanism therefor, of a plurality of cams on the end face of one of said cylinders for actuating said mechanisms.

2. In a printing press, the combination with rotary type and impression cylinders and paper feeding and stripping mechanism and inking mechanism therefor, of a plurality of cams on the end face of the type cylinder for actuating said mechanisms.

3. In a printing press, the combination with rotary type and impression cylinders and paper feeding and stripping mechanism

and inking mechanism therefor, of a plurality of progressively offset cams on the end face of the type cylinder for actuating said mechanisms.

4. In a printing press, the combination with a type cylinder and an impression cylinder geared together and a shiftable support for the impression cylinder adapted to throw it in and out of printing relationship, of a detent for the support to hold the impression cylinder in such relationship, a sheet gripping device on the impression cylinder and a sheet detector cooperating therewith and adapted to trip the detent when the gripper fails to act upon a sheet.

5. In a printing press, the combination with a type cylinder and an impression cylinder geared together and an eccentric support for the impression cylinder adapted to throw it in and out of printing relationship, of a detent normally maintaining the eccentric support in a position in which the impression cylinder is in such relationship, a sheet gripping device on the impression cylinder and a sheet detector cooperating therewith and adapted to trip the detent when the gripper fails to act upon a sheet.

6. In a printing press, the combination with a type cylinder and an impression cylinder geared together and an eccentric support for the impression cylinder adapted to throw it in and out of printing relationship, of a detent normally maintaining the eccentric support in a position in which the impression cylinder is in such relationship, a sheet gripping device on the impression cylinder, a sheet detector cooperating therewith and adapted to trip the detent when the gripper fails to act, and means actuated by the type cylinder for returning the eccentric support to normal position.

7. In a printing press, the combination with a type cylinder and an impression cylinder, a paper feeding device and a gripper on the impression cylinder having an actuating link provided with a roller, of a fixed cam ring having a shiftable end portion and means on the type roll for shifting the latter to direct the link roller to the inside or outside of the cam and maintain the same in either open or closed position.

8. In a printing press, the combination with a type cylinder and an impression cylinder geared together and an eccentric support for the impression cylinder adapted to throw it in and out of printing relationship, of a detent normally maintaining the eccentric support in a position in which the impression cylinder is in such relationship, a sheet gripping device on the impression cylinder embodying a plurality of fingers, a sheet detector cooperating therewith and embodying a plurality of fingers interspersed with those on the gripper and adapted to trip the detent when the gripper fails to act upon a sheet.

CECIL R. REDNER.