

May 30, 1939.

C. S. CRAFTS

2,160,613

ROTARY PRINTING PRESS

Filed Nov. 19, 1936

2 Sheets-Sheet 1

Fig. 1.

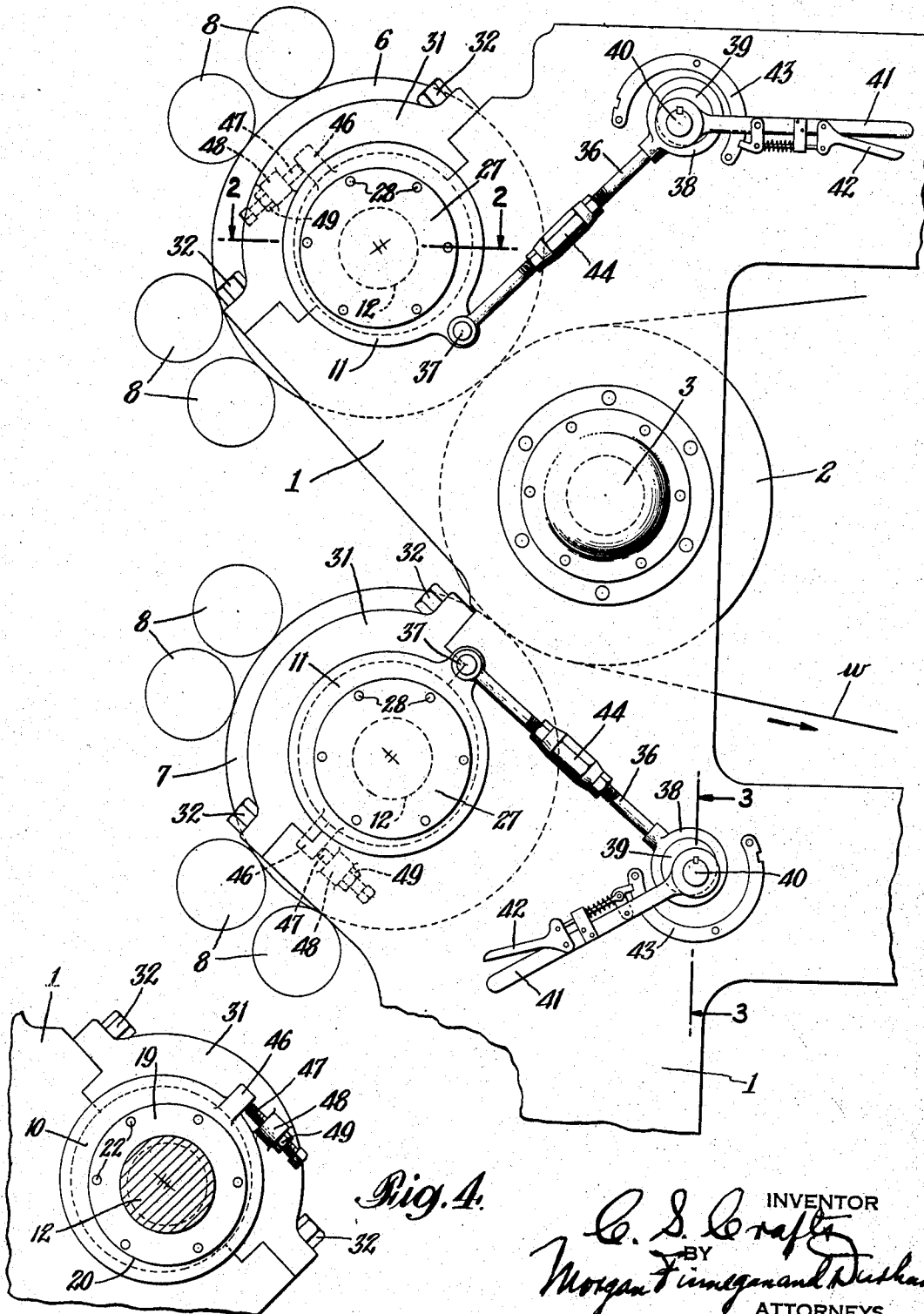


Fig. 4.

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2 Sheets-Sheet 2

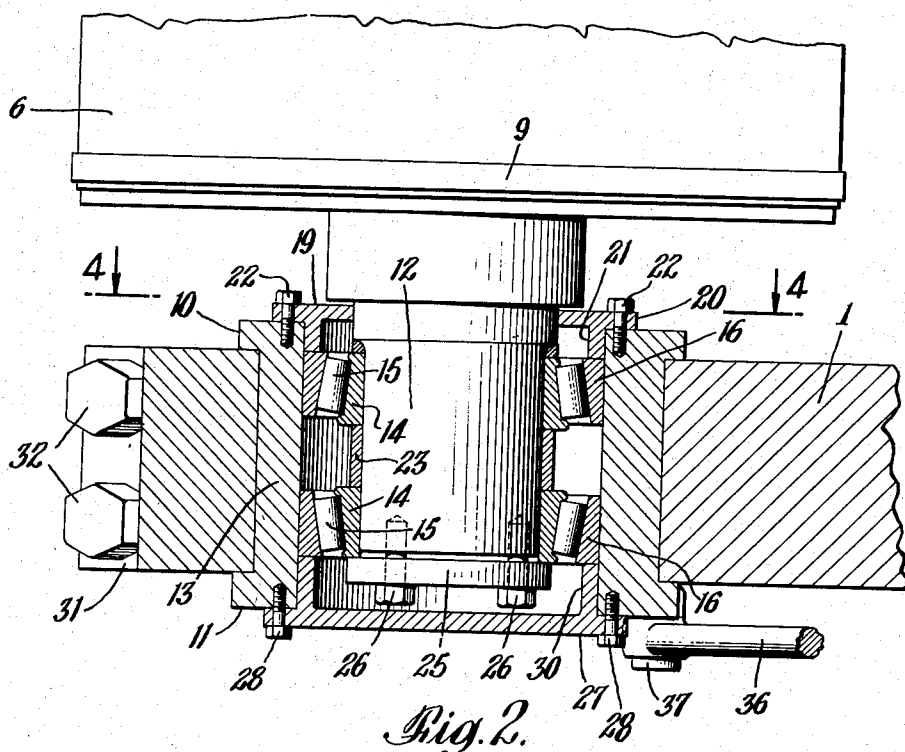


Fig. 2.

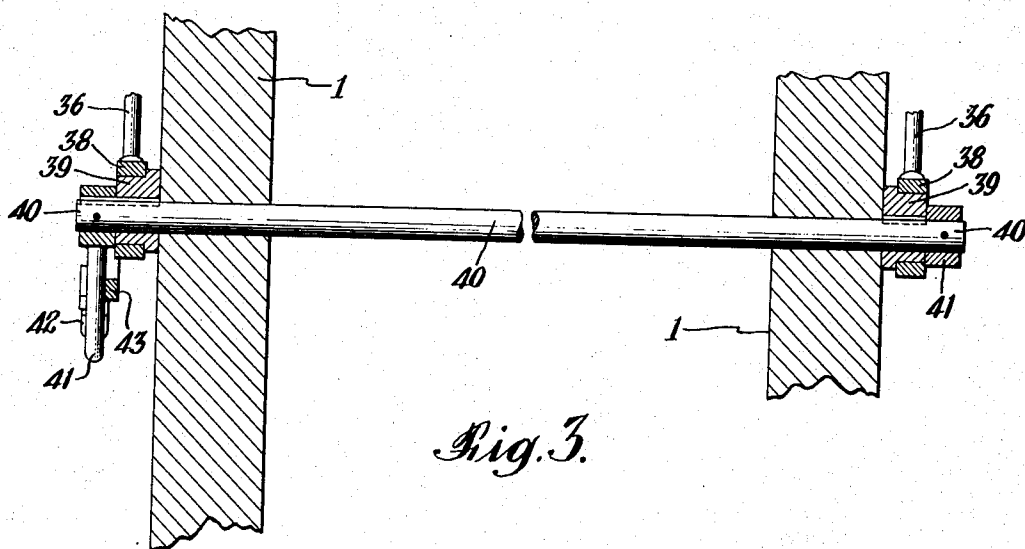


Fig. 3.

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UNITED STATES PATENT OFFICE

2,160,613

ROTARY PRINTING PRESS

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corporation of Illinois

Application November 19, 1936, Serial No. 111,571

16 Claims. (Cl. 101—247)

The invention relates to new and useful improvements in rotary printing presses, and more especially to such improvements in means for mounting, moving and controlling the printing cylinders.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:

Fig. 1 is a side elevation of a two-color rotary printing mechanism embodying the invention;

Fig. 2 is an enlarged section through a bearing of the plate cylinder taken on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged section through the mechanism for controlling the movements of and the pressure placed upon the plate cylinder, and is taken on line 3—3 of Fig. 1; and

Fig. 4 is a fragmentary sectional view taken on the line 4—4 of Fig. 2.

Objects of the invention are to provide rotary printing mechanisms of simple, reliable and efficient construction and especially capacitated for producing fine printing at relatively high speed; to provide means for effecting and controlling the relative movements of cooperating printing and impression cylinders; and for controlling the pressures and forces created or existent between said cylinders and in the press; to provide journal mountings for plate cylinders whereby they may be moved to and from impression, and in cooperation therewith means for exerting pressure to hold said bearings in their proper position to maintain their proper impression squeeze.

Referring now in detail to the embodiment of the invention illustrated by way of example in the accompanying drawings, the invention is shown embodied in a two-color machine and in said embodiment the side frames of the press are indicated by the reference numeral 1. An impression cylinder 2 is journaled in suitable bearings 3 mounted in the side frame 1. Cooperating with the impression cylinder 2 are two

plate cylinders 6 and 7, one for each of the two colors printed on the web *w* as it runs through the mechanism. Each of the plate cylinders is provided with form inking rolls 8 constituting part of an inking mechanism of any suitable or desired form, inking mechanism of the slidable carriage type being usually employed with magazine color presses such as is here exemplarily shown. Plate cylinders 6 and 7 and impression cylinder 2 are all provided with bearers 9 which limit the impression squeeze which may be exerted in printing.

Referring now to the means for moving the plate cylinders to and from impression, and for creating and regulating the pressures exerted thereon and for securing the plate cylinders and their bearings against vibrational movement during printing, said means are embodied with the journal mountings of the plate cylinders in the press frame, and the details are shown from the non-driving side of the press. The description of one of these mechanisms will suffice for all.

Shaft 12 at either end of the plate cylinder is journaled in double conoidal roller bearings, these bearings being mounted within a flanged hollow eccentric bushing 13. Each bushing 13 is rotatively mounted in the press frame 1, with its inside and outside flanges 10 and 11 abutting and overlapping the inside and outside faces of the side frame 1 of the press. Each of the anti-friction bearings has an inner inclined race ring 14 encircling the shaft 12 and having a sunken raceway in which run the bearing rollers 15. An inclined exterior ring 16 surrounds the rollers 15, the ring 16 being fitted tightly into the interior bore of the hollow eccentric bushing 13.

A hollow inner cap member 19 encircles the shaft 12, and has a flat exterior annular flange 20 abutting on the inner face of the eccentric bushing 13, and also a crown flange 21 fitting tightly within the bore of the eccentric bushing 13. Bolts 22 hold the cap in place. The inner edge of the crown flange 21 abuts on the inside face of the inner race ring 16, and a spacing collar 23 encircles shaft 12 between the race rings 14. A circular disk 25 abuts on the outer end of the cylinder shaft 12 and against the outer face of the outer race ring 14, and screw bolts 26 passing through plate 25 and threaded into the end of shaft 12 serve to hold the entire bearing together. An exterior circular cap 27 closes the outer end of the hollow bushing 13. This cap has a flat annular flange bearing on the outer face of the eccentric bushing 13 to which it is held by screw bolts 28. A crown flange 30 is integral with and

extends inwardly from the inner face of the cap 27, and the inner edge of this flange abuts on the outer face of the outer race ring 16, and the entire bearing is thus held in position within the eccentric bushing 13. A journal cap 31 fits into a stepped seat in the side frame 1 and is held in position by screw bolts 32.

Means are provided cooperating preferably with the eccentric bushings 13 for moving the plate cylinder to and from impression and also for effecting the printing pressure between the plate and form cylinders and likewise for holding the cylinder-bearings against vibrational movement during the running of the press. As embodied, the eccentric bushings 13 are positioned so as to move the plate cylinder to and from impression, and the means for effecting this comprises rods 36 pivotally connected at 37 to an ear or lug projecting from the exterior flange of the eccentric bushing 13. Fixed to the opposite end of rod 36 is an eccentric strap 38, mounted on an eccentric 39 which is keyed on a shaft 40. Shaft 40 extends across the press and is journaled in the vertical side frame 1 of the press. There is a similar mechanism at either side keyed on shaft 40. Fixed to one end of the shaft 40 is a hand lever 41, which carries a spring and latch holding mechanism 42 of usual type. The latch 42 cooperates with a notched segment 43 for the purpose of holding the eccentric mechanism in the different desired positions. Means are provided for accurately regulating pressure exerted on the press journal bearings, and for this purpose each of the rods 36 is provided with a turn-buckle 44. As embodied, the mechanism is arranged so that when the impression is on and the proper printing squeeze is being exerted, the pivotal connection 37 is in or approximately in the plane passing through the axes of the plate and impression cylinders. Diametrically opposite the pivot connection 37 is a suitable stop mechanism for stopping the rotative movement of the eccentric bushing, and as embodied a lug 45 projects radially and laterally outwardly from the inside flange of the eccentric bushing 13 (Figs. 1 and 4). A threaded stop pin 47 is screwed into a lug 48, which is fixed to and projects from the cap plate 31 of the bearing, and the stop pin is preferably provided with a lock nut 49. Lug 46 on the bushing strikes against the end of pin 47 carried on the frame. Thus, the stop 46, 47 and the rod 36 and its pivot connection 37 are connected to the bushing 13 at the opposite ends or faces of the bushing, and on opposite sides of the press side frame 1 in which the bearings are journaled. The exact stopping point for the rotative movement of the eccentric journal bushing, which determines the pressure exerted to hold the bearings seated in their frame, may be accurately regulated, and the final pressure exerted on the eccentric bushing journal may be likewise accurately regulated by the turn-buckle 44. Thus, the eccentric bushing may be brought to an exact position to maintain the precise amount of impression squeeze as determined by the bearers 9, and additional pressure may be exerted upon the journals, subsequent to the stopping of its rotative movement, this pressure in the illustrated embodiment being substantially parallel to and opposite in direction to the rotative movement of the plate cylinder at the line of printing contact between it and the impression cylinder, and thereby holding the cylinders

6 against vibrational movement with respect to the frame 1.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:

1. In a rotary printing press in combination, a printing couple comprising a rotatable plate cylinder and an impression cylinder, means for throwing on and off the impression and for maintaining the impression squeeze, and means for exerting regular pressure on the plate cylinder shaft and against its bearings while the impression is on and in the direction opposite to the rotative movement of the plate cylinder at the line of printing contact.

2. In a rotary printing press in combination, a printing couple comprising a rotatable plate cylinder and an impression cylinder, means for throwing one of said cylinders on and off impression, and means for exerting pressure on the shaft and bearings of said cylinder when the impression is on and in the opposite direction to the rotative movement of said cylinder at the printing contact line of said couple.

3. In a rotary printing press in combination, a press frame, a printing couple comprising a rotatable plate cylinder and an impression cylinder, eccentrics in which one of said cylinders is journaled, means for rotating said eccentrics in both directions to throw on and off the impression, and a stop against which the eccentric is rotated, said stop and rotating means being spaced apart on opposite sides of the frame.

4. In a rotary printing press in combination, a printing couple comprising a plate cylinder and an impression cylinder, eccentrics in which one of said cylinders is journaled, means for rotating said eccentrics in both directions to throw on and off the impression, and means for stopping rotation of said eccentrics, said means acting on the eccentrics on opposite sides of the cylinder axis and at points in line with the axes of the two cylinders.

5. In a rotary printing press in combination, a printing couple comprising a plate cylinder and an impression cylinder, and bearings therefor, eccentrics in which one of said cylinders is journaled, means for rotating said eccentrics in both directions to throw on and off the impression, and means for stopping rotation of said eccentrics, said means acting on the eccentric on opposite sides of the bearing and on opposite sides of the cylinder axis.

6. In a printing press, the combination of cooperating impression and plate cylinders, a press frame, rotatable eccentrics in which at least one of the cylinders is rotatably mounted, said eccentrics being provided with a stop limiting rotation of the eccentrics in the frame, a link connected to each eccentric opposite its stop and an eccentric connected to each link for rotating the first eccentric against its stop and for securely holding the first eccentrics in the frame.

7. In a printing press, the combination of cooperating impression and plate cylinders, a press frame, rotatable eccentrics in which at least one of the cylinders is rotatably mounted, said eccentrics being provided with a stop limiting rotation of the eccentrics in the frame, a link connected to each eccentric opposite its stop and an

eccentric connected to each link for rotating the eccentric against its stop and for securely holding the first eccentrics in the frame, said link and stop being connected to the eccentric on opposite sides of the frame.

8. In a printing press, the combination of cooperating impression and plate cylinders, a press frame, rotatable eccentrics in which at least one of the cylinders is rotatably mounted, said eccentrics being provided with a stop limiting rotation of the eccentrics in the frame, a variable length link connected to each eccentric diametrically opposite its stop and an eccentric member connected to each link for rotating the eccentric against its stop and for securely holding the first eccentrics in the frame, said stop and link being on opposite faces of the eccentric.

9. In a rotary printing press in combination a press frame, a plate cylinder journaled in the frame, a cooperating impression cylinder journaled in the frame, means for effecting and regulating the impression squeeze between said cylinders, and means operating after the impression squeeze is on for pressing the plate cylinder bearings powerfully against the frame in a direction substantially normal to the plane passing through the axes of the plate and impression cylinders.

10. In a rotary printing press in combination a press frame, a plate cylinder journaled in the frame, a cooperating impression cylinder journaled in the frame, bearings for the plate cylinder including eccentrics rotatable to effect and regulate the impression squeeze, variably positionable means for stopping rotation of said eccentrics, and means for exerting pressure between said stopped bearings and the press frame substantially normal to the plane passing through the axes of the cylinders.

11. In a rotary printing press in combination a press frame, a plate cylinder journaled in the frame, a cooperating impression cylinder journaled in the frame, bearings for the plate cylinder including eccentrics rotatable to effect and regulate the impression squeeze, means for variably rotating said eccentrics, and means operating when the impression squeeze is on acting on said eccentrics and including stops for limiting the rotation of said eccentrics for exerting pressure between said bearings and the press frame in a direction substantially normal to the plane passing through the axes of the cylinders.

12. In a rotary printing press in combination a press frame, a plate cylinder journaled in said frame, an impression cylinder journaled in said frame, bearings for the plate cylinder including eccentrics rotatable to effect and regulate the impression squeeze, means for actuating said eccentrics including longitudinally movable rods pivoted to the eccentrics, and means operating when the impression squeeze is on for exerting pressure between said bearings and the press frame in a direction substantially normal to the plane passing through the axes of the cylinders, said means including cooperating stops on the eccentrics and on the press frame located on the opposite side of the plate cylinder axis from the impression cylinder.

13. In a rotary printing press in combination a

press frame, a plate cylinder journaled in said frame, an impression cylinder journaled in said frame, bearings for said plate cylinder including eccentrics rotatable to effect and regulate the impression squeeze and means for actuating said eccentrics and connected to the eccentrics at a point substantially between the axes of the cylinders, and cooperating means operating when the impression squeeze is on for exerting pressure between said bearings and the press frame in a direction substantially normal to the plane passing through the axes of said cylinders including a stop preventing rotational movement of an eccentric and located on the opposite side of the plate cylinder axis from said actuating means.

14. In a rotary printing press in combination, a printing couple comprising a plate cylinder and an impression cylinder, eccentric bearings for the plate cylinder mounted in the frame and rotatable to regulate the impression squeeze, a variably positionable device for stopping the rotational movement of said eccentric bearings to determine the amount of the impression squeeze, and means for rotating said bearings until stopped at impression by said stop device and for subsequently applying rotative pressure to the bearings against said stop device in the opposite direction to the movement of the plate cylinder at the line of impression contact of said cylinder.

15. In a rotary printing press in combination, a printing couple comprising a plate cylinder and an impression cylinder, eccentric bearings for the plate cylinder mounted in the frame and rotatable to regulate the impression squeeze, a variably positionable device for stopping the rotational movement of said eccentric bearings to determine the amount of the impression squeeze, said device being located approximately in the common axial plane of the two cylinders, and means for rotating said bearings until stopped at impression by said stop device and for subsequently applying rotative pressure to the bearings against said stop device in the opposite direction to the movement of the plate cylinder at the line of impression contact of said cylinder, said rotating means acting on the eccentric bearings at a point substantially diametrically opposite to said stop device.

16. In a rotary printing press in combination, a printing couple comprising a plate cylinder and an impression cylinder, eccentric bearings for the plate cylinder mounted in the frame and rotatable to regulate the impression squeeze, a variably positionable device for stopping the rotational movement of said eccentric bearings to determine the amount of the impression squeeze, said device being located approximately in the common axial plane of the two cylinders, and on the opposite side of the plate cylinder axis from the impression cylinder, and means for rotating said bearings until stopped at impression by said stop device and for subsequently applying rotative pressure to the bearings against said stop device in the opposite direction to the movement of the plate cylinder at the line of impression contact of said cylinder.

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