May 4, 1937. C. S. CRAFTS 2,079,001

PRINTING PRESS

Original Filed Sept. 15, 1933 2 Sheets-Sheet 1

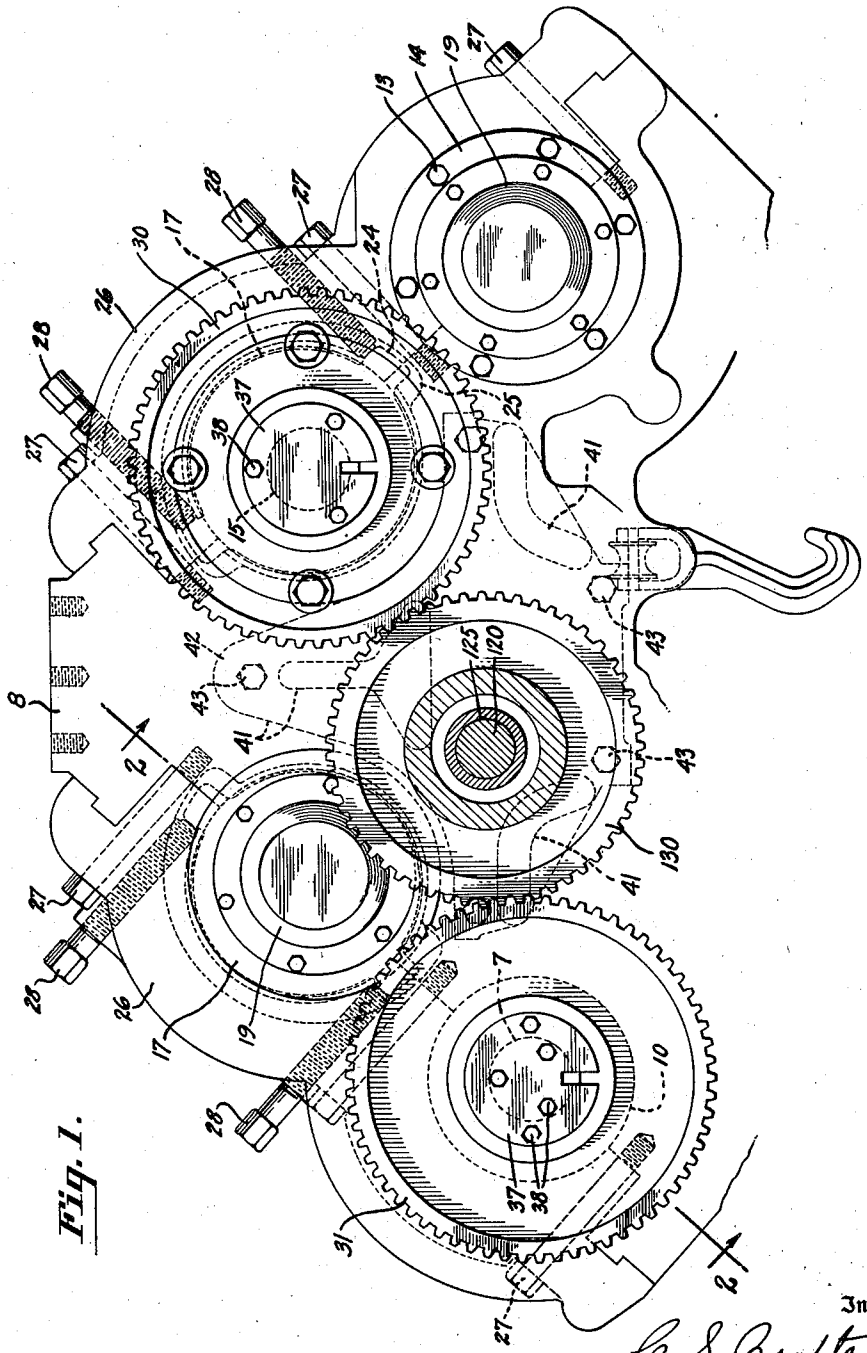


Fig. 1.

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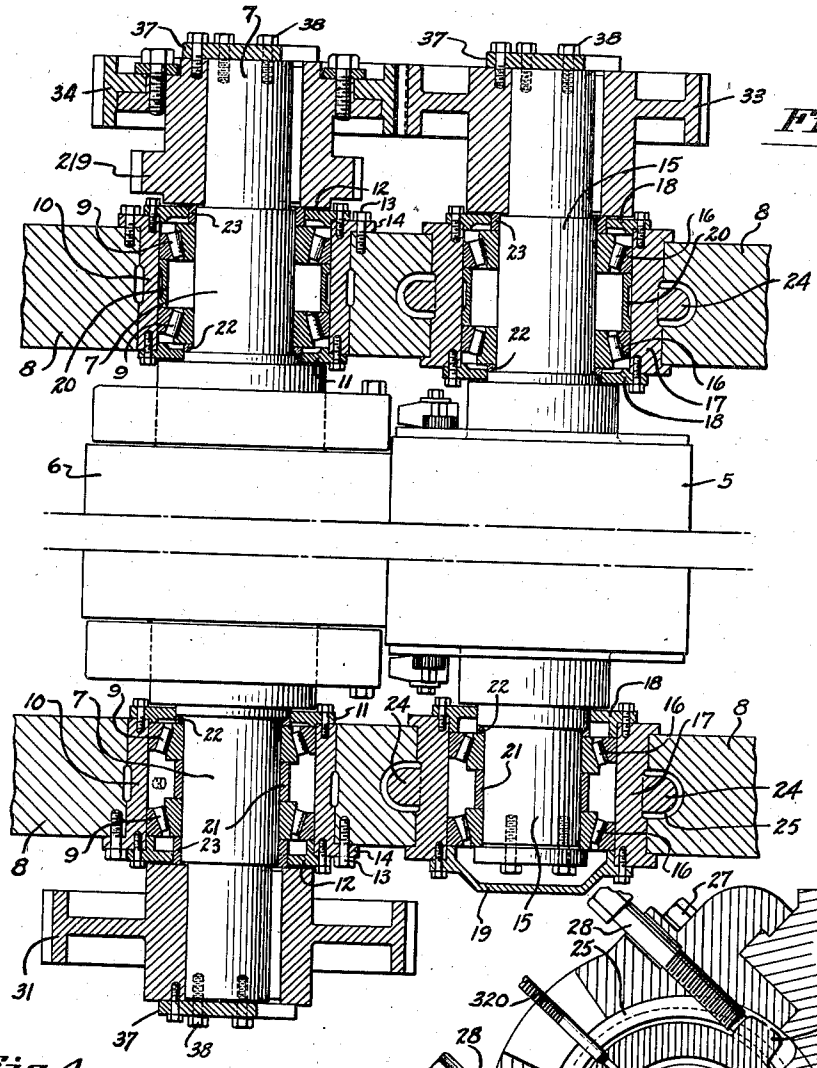


Fig. 2.

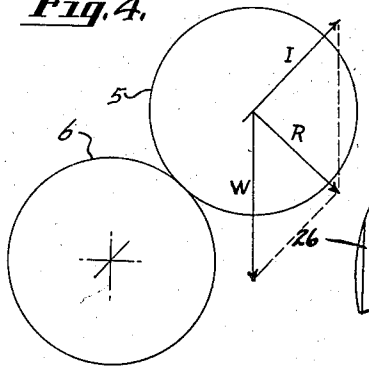


Fig. 4.

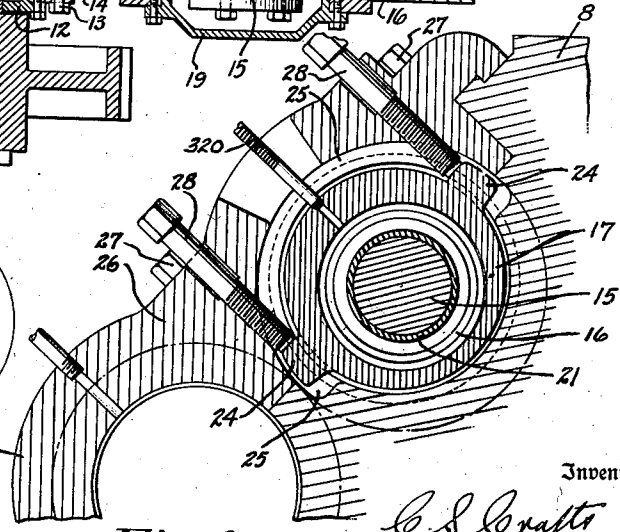


Fig. 3.

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Patented May 4, 1937 2,079,001

UNITED STATES PATENT OFFICE

2,079,001

PRINTING PRESS

Curtis S. Crafts, Oak Park, Ill., assignor to The Goss Printing Press Company, Chicago, Ill., a corporation of Illinois

Original application September 15, 1933, Serial No. 689,512. Divided and this application November 3, 1934, Serial No. 751,289. In Great Britain February 8, 1934

12 Claims. (Cl. 101—247)

The present invention relates to printing presses and more particularly to a novel and improved bearing and impression adjustment for rotary printing press adapted for the printing of newspapers at high speeds.

This application is a division of my copending application Serial No. 689,512, filed September 15, 1933.

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:

Figure 1 is a fragmentary detailed side elevation, with certain parts shown in section, of an illustrative embodiment of the invention and showing the gears for driving the printing couple;

Figure 2 is a section taken on the line 2—2 of Figure 1.

Figure 3 is a fragmentary vertical section through the bearing and frame at one end of a cylinder.

Figure 4 is a vector diagram of the principal forces acting in the structure shown in the other figures.

The present invention has for its object the provision of a novel and improved bearing mounting for a high-speed rotary press. A further object of the invention is the provision of a novel and improved means for varying the pressure between the impression and printing cylinders in which the bearing is locked by pressure applied directly against and in the direction of the normal operating load. Another object of the invention is the provision of a novel and improved means for varying the pressure between the impression and printing cylinders of a high speed rotary printing couple such as is adapted for the printing of newspapers. Still another object is the provision of such a mechanism which can be continuously lubricated in any of its positions of adjustment.

In accordance with the illustrative embodiment of the present invention, the printing and impression cylinders are rotatably mounted in the side frames of the press by means of bearings which can be individually removed as a unit from the side frames without disassembly of the bearings, thereby insuring that the bearings will remain in proper running condition even when removed from the press by unskilled workmen. In order to provide for varying the impression pressure between the printing cylinder and its impression cylinder, the bearings for one of the cylinders are mounted in eccentrics, one at either end of the cylinder, and other means are provided for rotating the eccentrics and locking them in any desired position. As embodied, the eccentrics are formed with radially extending ears, substantially diametrically opposed to each other, and relatively heavy screws are threaded in the bearing caps and bear against the ears. Thus when it is desired to vary the impression pressure, one of the screws at each end of the cylinder may be loosened, the other screw at each end may be tightened to rotate the eccentric, and then the first screws are tightened to securely hold the eccentrics and cylinder bearings against vibration during the operation of the press. The tightening of the screws on both sides of the cylinder shaft serve to lock the eccentric by pressure applied substantially in the direction of the normal operating load which is the resultant of the pressure between the plate and impression cylinders and of the gravitational loads.

It will be understood that the foregoing general description and the following detailed description as well are exemplary and explanatory of the invention but are not restrictive thereof.

Referring now in detail to the accompanying drawings showing an illustrative embodiment of the present invention, the printing unit 1 comprises a pair of printing couples adapted to perfect a web of paper, each couple comprising an impression cylinder 5, and a printing cylinder 6 which is provided with the usual parti-cylindrical printing plates. Impression cylinders 5 and printing cylinders 6 may be of substantially conventional construction, and for that reason are not described in detail.

The plate cylinders 6 are rotatably mounted in the side frames 8 by means of their projecting shaft ends 7 and roller bearings 9 which are seated in annular sleeves 10. Bearings 9 are held within their sleeves 10 by means of flanges 11 and 12 which or bolted to the opposite sides of sleeves 10, while sleeves 10 are held against angular or axial movement by means of screws 13 passing through the flange 14, integral with sleeve 10, and threaded into the frame 8.

Impression cylinders 5, cooperating with their plate cylinders 6 are likewise mounted in the frames 8 by means of their projecting shaft ends 15 on which are mounted roller bearings 16 seated in eccentric annular sleeves 17, and retained therein by means of flange 18, at the right, or by a capping plate 19 at the left end.

The cylinders 5 and 6 of both printing couples may be mounted in the same manner, and the mounting of only one couple will be described in detail.

At one end of the cylinders, the bearings 9 and 16 are held apart by means of a spacer ring 20 positioned between the outer races of the bearings and are a sliding fit in their supporting sleeves, whereas at the other end of the cylinders the bearings are held apart by spacing ring 21 positioned between the inner races of the bearings and are a press fit on the cylinder shaft. At the ends, the inner bearings abut against the ring 22 fitted to a shoulder of the shaft 7 or 15. The inner race of the outer bearings 9 or 16 is pressed inwardly by means of a spacer ring 23 fitted closely to the shaft and extending between the inner race and an abutting gear or capping plate.

In accordance with the present invention means are provided for varying the pressure exerted during printing between the plate cylinder 6 and impression cylinder 5, and as embodied, the eccentric sleeves 17 may be minutely angularly moved to and held in any desired position. In the illustrative embodiment, each sleeve 17 is provided with a pair of diametrically opposed radially extending ears 24 which project into a correspondingly enlarged portion 25 of the frame recess in which sleeve 17 is seated. Sleeves 10 and 17 are held in place by means of the frame capping member 26 which is secured to the main portion of frame 8 by bolts 27. Opposed screw-threaded members are provided adapted to bear against the ears 24, and as embodied screws 28 are provided on opposite sides of the sleeve 17 and are threaded into the capping plate 26, extending upwardly so as to have their heads accessible from the upper part of the press frame. Screws 28 may be tightened against the ears 24 to hold the eccentric sleeve 17 in any desired position, or by loosening one screw 28 and tightening the other, the eccentric sleeve may be angularly moved to any desired position, in which it may be held by tightening the loosened screw.

At their right-hand ends, the impression cylinder 5 and plate cylinder 6 are provided with gears 33 and 34 mounted on shafts 15 and 7 respectively, these gears meshing together so that the impression cylinder 5 is driven from the plate cylinder 6, while cylinder 6 is driven in any suitable manner through gears 31 and 130. Oil under pressure may be supplied to the bearings for cylinders 5 and 6 through pipes 320 and 336, pipe 320 extending through a slot in the cap 26 to permit movement of the eccentric 17.

In disassembly of the press, the bearing caps 26 may be removed by loosening the cap screws 27, thereby permitting the caps to be removed from the side frames and freeing the bearings and bearing cartridges of the cylinders 5 and 6. After removal of the cylinders from the press, the bearing cartridges may be removed as a unit from their shafts, simply by removal of the caps 37 and screws 38 at the ends of the shafts.

As shown in Fig. 4 of the drawings, a typical impression pressure is represented by the vector I, while a typical gravitational load on the bearings for cylinder 5 is represented by the vector W. The resultant of these vectors is the vector R, representing the normal operating load, which is in the direction of the pressure applied by the screws 28. Of course, as the impression pressure is varied, vector I changes, shifting the vector R very slightly, but the figure represents typical operating conditions.

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 printing press, a printing couple, a frame in which the cylinders of said couple are journalled, and means for variably positioning one cylinder relatively to the other including an eccentric which is angularly movable and means acting in the direction of the normal operating load of the couple for exerting pressure on the eccentric to hold it against said frame.

2. In a printing press, a printing couple, a frame in which the cylinders of said couple are journalled, and means for variably positioning one cylinder relatively to the other including an angularly movable eccentric in which the cylinder bearings are mounted and screw-threaded means for pressing the eccentric in the line of its normal operating load to move the one cylinder relatively to the other cylinder.

3. In a printing press, a printing couple, a frame in which the cylinders of said couple are journalled, means for variably positioning one cylinder relatively to the other including an angularly movable eccentric in which the cylinder bearings are mounted and screw threaded means seated in the frame pressing directly in the line of the normal operating load on the cylinder.

4. In a printing press, a printing couple, a frame in which the cylinders of said couple are journalled, means for variably positioning one cylinder relatively to the other including a member movable toward and from the other cylinder and in which the cylinder bearings are mounted and releasable means for exerting pressure against said member in the direction of the normal operating load on the cylinder.

5. In a printing press, in combination, a printing couple, a frame in which the cylinders of said couple are journaled, and means for variably positioning one cylinder relatively to the other including an integral eccentric in which said cylinder is journaled and two screw-threaded members adapted to exert pressure on said eccentric in the same direction.

6. In a printing press, in combination, a printing couple, a frame in which the cylinders of said couple are journaled, and means for variably positioning one cylinder relatively to the other including a complete eccentric in which said cylinder is journaled and two screw-threaded members positioned on opposite sides of the cylinder shaft and adapted to exert pressure on said eccentric in the same direction.

7. In a printing press, in combination, a printing couple, a frame in which the cylinders of said couple are journaled, and means for variably positioning one cylinder relatively to the other including an integral eccentric in which said cylinder is journaled and screw-threaded means acting in a direction substantially at right angles to the plane passing through the axes of the cylinders of the printing couple adapted to angu-

larly position said eccentric and to press it against its bearing.

8. In a printing press, in combination, a printing couple, a frame in which the cylinders of said couple are journaled, and means for variably positioning one cylinder relatively to the other including an eccentric in which said cylinder is journaled and screw-threaded means adapted to angularly position said eccentric and to press it against its bearing in a direction transverse to the plane through the axes of said cylinders.

9. In a printing press, in combination, a printing couple, a frame in which the cylinders of said couple are journaled, and means for variably positioning one cylinder relatively to the other including an eccentric in which said cylinder is journaled and a plurality of screw-threaded members cooperating to angularly position said eccentric and to conjointly press it against its bearing in a direction transverse to the plane through the axes of said cylinder.

10. In a printing press, in combination, a printing couple, a frame in which the cylinders of said couple are journaled, and means for variably positioning one cylinder relatively to the other including a complete eccentric in which said cylinder is journaled, ears on said eccentric, screw-threaded members on either side of the cylinder shaft and movable in opposite directions to angularly position the eccentric and movable in the same direction to press the eccentric against its bearing.

11. In a printing press, a printing couple, a frame in which the cylinders of the couple are journalled and means for variably positioning one cylinder relatively to the other including an eccentric which is angularly movable, and means for exerting pressure on the eccentric in a direction substantially normal to the plane passing through the axes of the couple cylinders.

12. In a printing press, a printing couple, a frame in which the cylinders of the couple are journalled, means for variably positioning one cylinder relatively to the other including a member movable toward and from the other cylinder and in which the cylinder bearings are mounted and means for exerting pressure against said member in the direction normal to the plane interconnecting the axes of the couple cylinders.

CURTIS S. CRAFTS.