United States Patent [19]

Paulson

[11] **3,817,174**

[45] **June 18, 1974**

[54] **PRINTING PRESS CYLINDER RELEASE SYSTEM**

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[22] Filed: **Sept. 7, 1972**

[21] Appl. No.: **287,061**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 68,818, Sept. 2, 1970, abandoned.

[52] **U.S. Cl.**..... **101/218,** 101/220, 101/247

[51] **Int. Cl.**..... **B41f 7/02**

[58] **Field of Search**..... 101/218, 247, DIG. 10, 101/DIG. 11, 220, 229–231, 221

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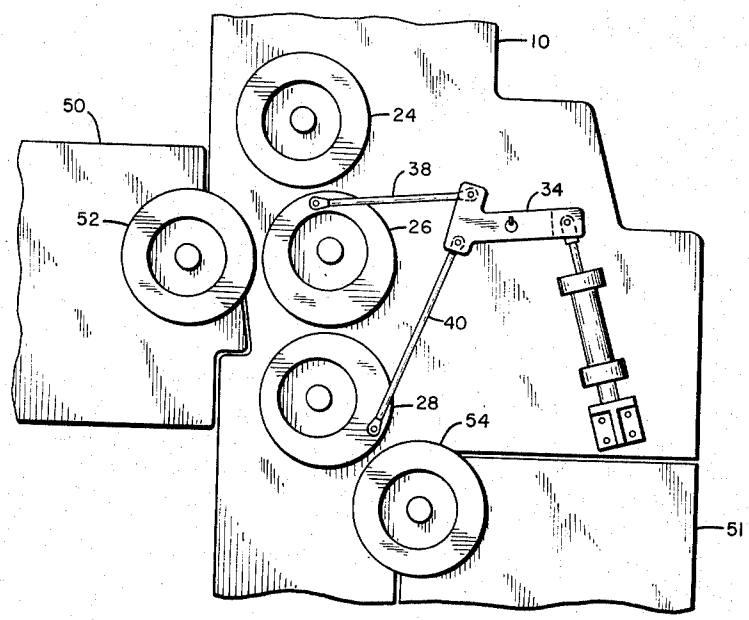
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[57] **ABSTRACT**

The blanket cylinder and impression cylinder of a printing press are mounted in eccentric bearings at each end which bearings can be rotated by a multiple bell crank linkage from an air cylinder so as to disengage the cylinders in generally opposite directions from each other and generally away from all the plate cylinders in the press.

1 Claim, 3 Drawing Figures



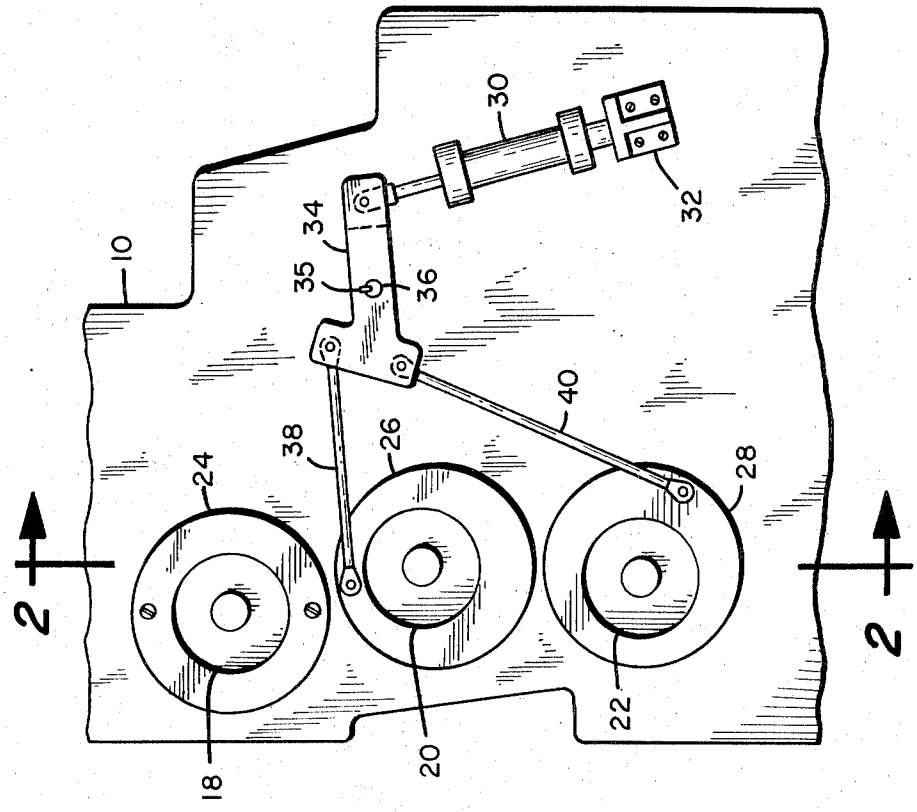


Fig. 1

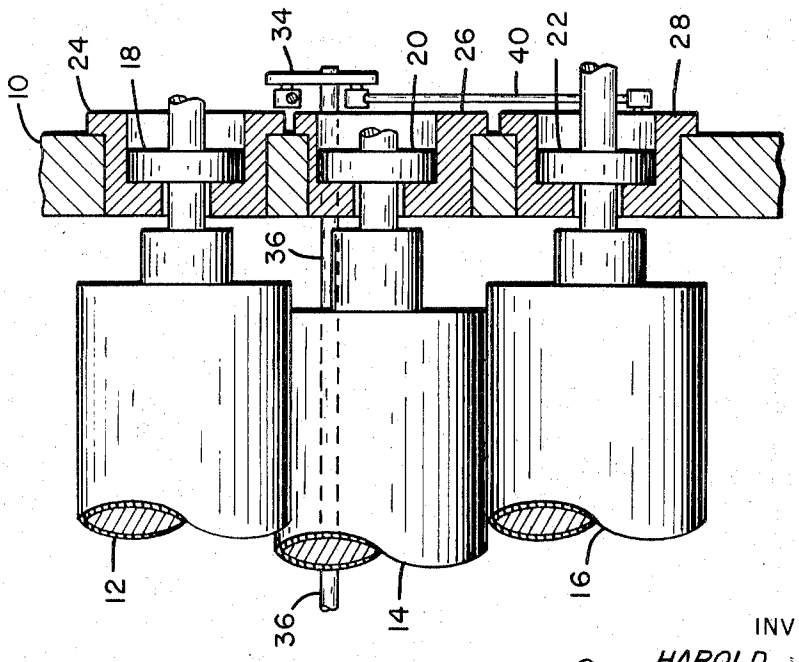


Fig. 2

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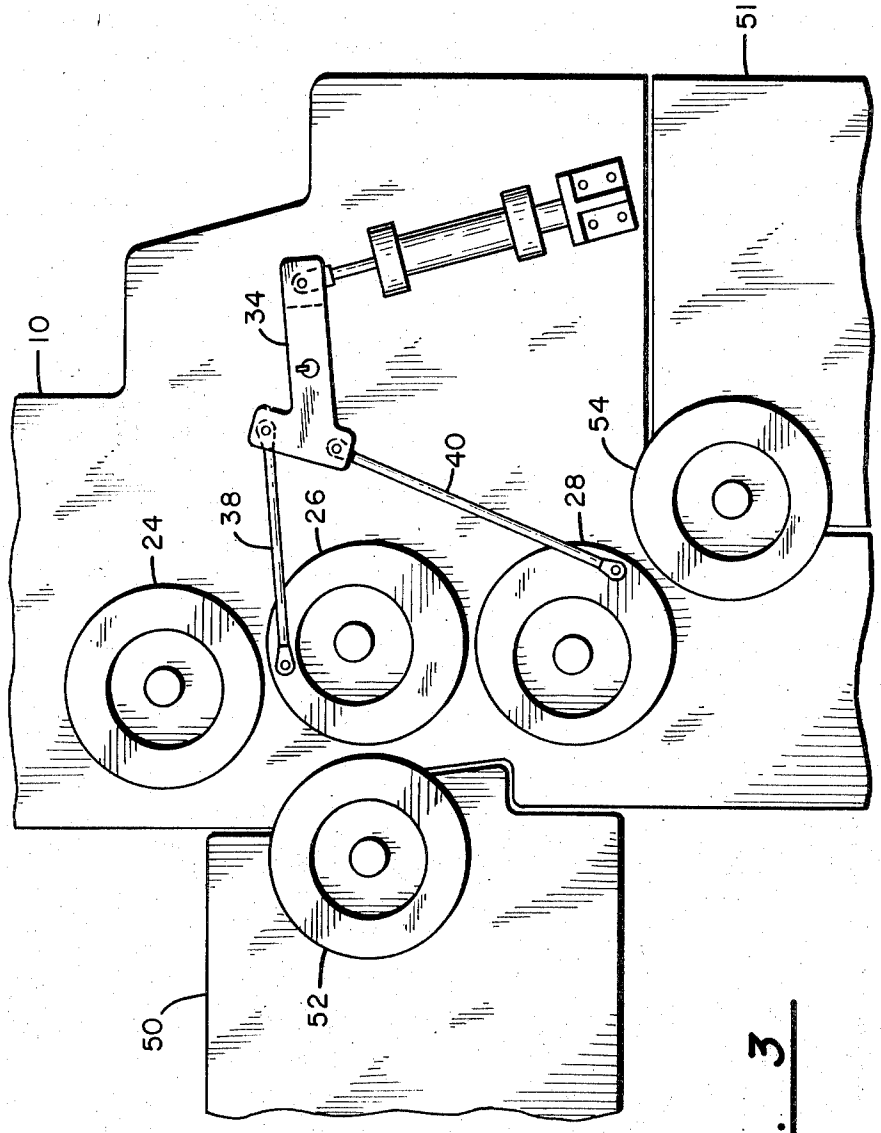


Fig. 3

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PRINTING PRESS CYLINDER RELEASE SYSTEM

This application is a continuation-in-part of my prior copending application of the same name, Ser. No. 68,88 filed Sept. 2, 1970, now abandoned.

BACKGROUND OF THE INVENTION

In the prior art, printing press blanket cylinders have been mounted in bearing blocks adapted to slide in grooved tracks in the frame of the press. The cylinders could be disengaged by hydraulically sliding the bearing block sideways. The problem with this approach is that the relative sliding motion of the cylinders does not afford as clean a separation as might be desired and often produces a smear in the ink image on the cylinders. Smears could be avoided by moving both the blanket and impression cylinders simultaneously and in generally opposite directions from each other, however, the consequent complex array of sliding bearing blocks and hydraulics would be prohibitively bulky and expensive. Furthermore, the prior art approach is impossible to apply to more complicated two and three color presses which employ more plate and blanket cylinders. The present invention avoids the above mentioned problems by providing apparatus to simultaneously move both the blanket and impression cylinders away from each other and away from the corresponding plate cylinders with one air cylinder.

SUMMARY OF THE INVENTION

Briefly, the present invention contemplates mounting the blanket and impression cylinders in rotatable eccentric mounts. An air cylinder is connected to the eccentric mounts by a bell crank linkage so that the eccentric mounts can be rotated simultaneously thus pulling all of the cylinders quickly out of contact. It may therefore be seen that it is an object of my invention to provide an improved printing press cylinder release means. It is a further object of my invention to provide a cylinder release mechanism adaptable to multiple color presses with little or no modification. Further objects and advantages will become apparent upon consideration of the following description and drawings.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a schematic view of a portion of a printing press demonstrating the relative positions of the eccentric mounts and the actuating linkage therefore.

FIG. 2 is a side view of the apparatus of FIG. 1 showing portions of the cylinders therein and showing the eccentric mounts in a sectional view taken along line 2—2 in FIG. 1.

FIG. 3 shows how the present release mechanism may be adapted to more complex multiple color printing presses.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring simultaneously to FIGS. 1 and 2, a plate cylinder 12, a blanket cylinder 14, and an impression cylinder 16 are shown supported respectively by bearings 18, 20, and 22 in three rotatable bearing carriers 24, 26 and 28. Carriers 26 and 28 are designed to be slightly eccentric. Cylinders 14 and 16 are simultaneously moved and disengaged by an air cylinder 30. Air cylinder 30 operates between a bracket 32 and a bell crank 34 which crank pivots on a shaft 36 carried in frame member 10. Connected to the opposite end of crank 34 are two actuating arms 38 and 40 connected to eccentric bearing carriers 26 and 28. Arms 38 and 40 are pivotally mounted on crank 34 and carriers 26 and 28.

The printing press cylinders are disengaged by activating air cylinder 30 to pull on crank 34 and arms 38 and 40. Bearing 20 is positioned above the axis of rotation of bearing carrier 26 so that the pulling action of arm 38 moves cylinder 14 to the right in FIG. 1. Bearing 22 is displaced to the left of the axis of rotation of bearing carrier 28 so that the pulling action of arm 40 rotates carrier 28 counterclockwise to move cylinder 16 downward in FIG. 1. Identical eccentric bearing carriers are used at the other ends of cylinders 14 and 16 actuated by linkage similar in design to crank 34. Shaft 36 is keyed to crank 34 by a keyway 35 so that the torque from air cylinder 30 is carried through the printing press to the corresponding crank on the opposite side of the machine. Consequently, cylinders 14 and 16 are moved from both ends. Since both the blanket and impression cylinders move simultaneously, a clean separation is afforded and smears are prevented.

In FIG. 3 the instant invention is applied to a multiple color printing press as is schmatically shown. A secondary frame 50 supports a plate cylinder bearing carrier 52 adapted to carry a second plate cylinder into contact with blanket cylinder 14. Thus, a second image can be transferred onto blanket cylinder 14 in a different color ink. For even more colors a third plate cylinder is positioned below and to the right of the impression cylinder. In the preferred embodiment the third plate cylinder is carried by a bearing 54 in a secondary frame 51.

The press as shown in FIG. 3 of the drawings can be used in two modes. The paper stock passes between the cylinders 14 and 16 carried in bearings 26 and 28 where printing may take place on the top surface of the paper. The images are transfered by blanket cylinder 14 from plate cylinder 12 and the second plate cylinder carried in bearing 52.

In the second mode the third plate cylinder in bearing 54 may permit additional printing on impression cylinder 16 which can then be put directly on to the back side of the paper passing between rolls 14 and 16 at the same time the other printing is taking place on the front surface.

To avoid printing smears both the impression cylinder 16 and the blanket cylinder 14 must be quickly removed from the paper stock. My invention achieves 50 percent faster separation by moving cylinder 14 and cylinder 16 simultaneously, with the same throw, in directions as much opposite to each other as is possible with three plate cylinders. This is to be contrasted with prior art embodiments in which the cylinders move generally in the same direction.

Fast separation is important because if the plates do not separate quickly enough, once the paper has passed through, the printed matter on the blanket cylinder 14 is transfered onto cylinder 16 where it travels around to be printed on the back side of the next piece of paper.

As can be seen in FIG. 3, the same linkage which works to disengage one blanket cylinder from one impression cylinder and one plate cylinder may be used to disengage a blanket and an impression cylinder from three plate cylinders. Carrier 26 moves to the right as

before, however, the eccentric insert in carrier **28** is positioned so that the pull of arm **28** will rotate impression cylinder **28** down and to the left so as to separate it from both of the contacting cylinders. Most importantly the rolls **14** and **16** have components of motion generally opposite to each other so as to separate very quickly and completely and in 50 percent less time.

I Claim

1. In a printing press cylinder separation mechanism the combination of:

a frame,

a first plate cylinder,

a blanket cylinder in rolling contact with the bottom of said first plate cylinder,

an impression cylinder in rolling contact with the bottom of said blanket cylinder,

a second plate cylinder in rolling contact with the side of said blanket cylinder;

a third plate cylinder in rolling contact with the bottom of said impression cylinder but displaced to one side, which side is opposite from the side of contact of said second plate cylinder,

rotatable eccentric bearing carriers mounted for rotation in said frame and adapted to support said first blanket cylinder and said impression cylinder, and

rotating means connected to said rotatable carriers adapted to rotate said carriers in a direction to move said blanket cylinder and said impression cylinder in generally opposite directions from each other and out of contact with the first, second, and third plate cylinders, which rotating means comprises a pair of pivotally mounted arms connected to said rotatable carriers at each end of said blanket and impression cylinders and to an actuating means, said actuating means comprising an air cylinder mounted to move a pair of bell crank members connected together by a torque member through the frame, said pivotally mounted arms being connected between said crank member and said rotatable carriers.

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