Jan. 2, 1940. L. R. JOHNSON 2,185,440

PLATEN PRINTING PRESS

Filed Dec. 1, 1937

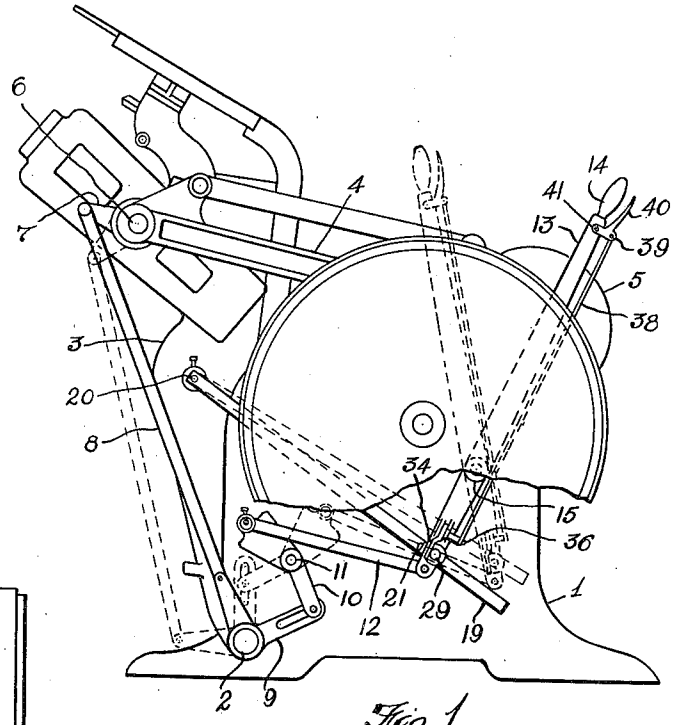


Fig. 1

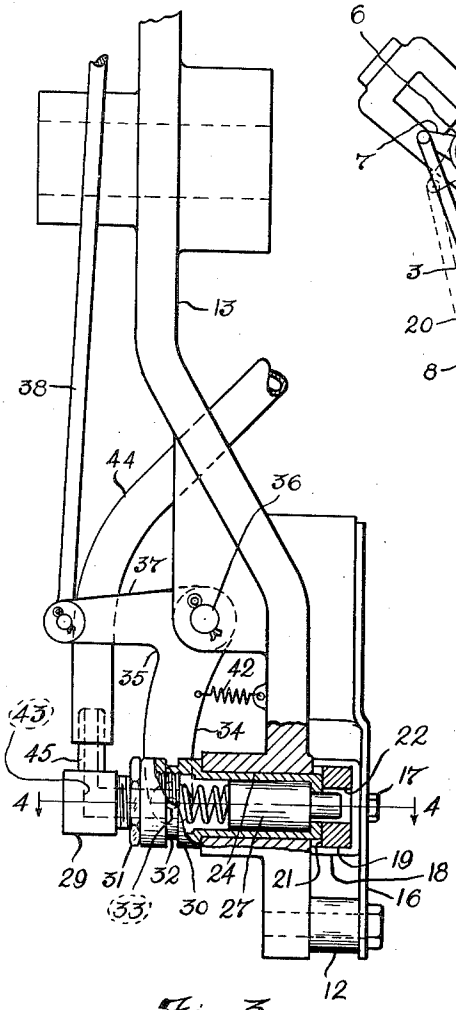


Fig. 3

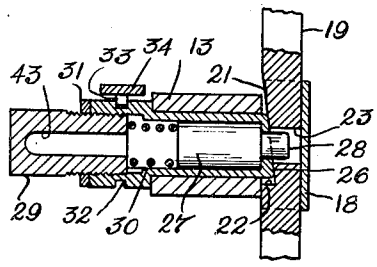


Fig. 4

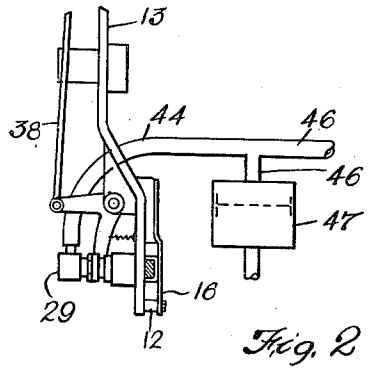


Fig. 2

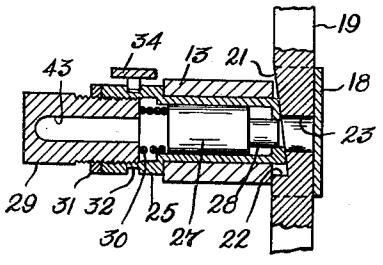


Fig. 5

INVENTOR.
Lawrence R. Johnson
BY
Paff Oberlin & Paff
ATTORNEYS.

Patented Jan. 2, 1940 2,185,440

UNITED STATES PATENT OFFICE

2,185,440

PLATEN PRINTING PRESS

Lawrence R. Johnson, Cleveland, Ohio, assignor to The Chandler & Price Company, Cleveland, Ohio, a corporation of Ohio

Application December 1, 1937, Serial No. 177,610

3 Claims. (Cl. 101—299)

This invention relates, as indicated, to printing presses of the Gordon or platen type, but has reference more particularly to presses of this type which are provided with pneumatic suction devices for feeding sheets to and delivering them from the platen of the press.

Suction devices of the aforesaid character usually include oscillatable tubular arms provided with sucker tip assemblies adapted to engage or contact the sheets and valves for periodically breaking the vacuum in the arms and sucker tips when suction is not desired.

In order to prevent injury to the type form and other parts of the press in case of failure of the feeder sucker tips to feed a sheet to the platen, it is customary in such cases, pending restoration of the vacuum in the sheet-feeding means, to either stop the press or to manually move the throw-off lever into operation. The starting and stopping of a press not only results in a loss of time but causes a strain on various parts of the press, besides the loss of electrical energy in starting, which, in the case of a large heavy press, is an item of considerable expense. Moreover, by the time the throw-off lever is manually moved into operation, irreparable damage may have been done to the type form or other parts of the press.

The present invention has as its primary object the elimination of the foregoing difficulties and disadvantages by the provision of means responsive to the failure or breaking of the vacuum in the sheet feeding means for automatically throwing into operation the throw-off lever of the press.

Another object of the invention is to provide means responsive to the reestablishment of the vacuum for automatically restoring the throw-off lever to its inoperative position.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims; the annexed drawing and the following description setting forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical means in which the principle of the invention may be used.

In said annexed drawing:

Fig. 1 is a fragmentary side elevation of a Gordon or platen type printing press embodying the invention;

Fig. 2 is a more or less diagrammatic view showing the arrangement of the various suction lines;

Fig. 3 is a view on an enlarged scale and partly in section of a portion of the mechanism shown in Fig. 2;

Fig. 4 is a cross-sectional view, taken in the line 4—4 of Fig. 3; and

Fig. 5 is a view similar to Fig. 4, but showing the plunger in normal retracted position.

A printing press of the Gordon or platen type includes, as indicated in Fig. 1, a frame 1 having pivotally mounted thereon, as at 2, a bed 3, which is oscillated by means of side arms 4, driven by the large gear cam wheel 5 and small head and lock cam (not shown) on the ends of the main shaft (not shown) of the press. The outer ends of the side arms 4 are pivotally connected to the eccentric pins or gudgeons 6 at the ends of the back shaft of the press.

As is usual in this type of press, means are also provided for oscillating the back-shaft in its bearings so as to locate the bed for printing and throw-off positions respectively, such means being well understood by those skilled in the art and including a throw-off saddle 7 which is rigidly secured to the back shaft and various links and levers which are shown in Fig. 1. The latter includes a link 8, a bell crank lever 9 pivoted on the shaft about which the bed 3 pivots, a bell crank lever 10, pivoted as at 11 on the frame 1 of the press, a link 12 and a throw-off lever 13 having an operating handle 14. The throw-off lever 13 is pivoted intermediate its ends to the frame of the press, as at 15. When the bed of the press is in printing position, the various links and levers are positioned as shown in solid lines in Fig. 1 and when the bed is in the throw-off position, said links and levers occupy the position shown in dotted lines in this figure.

The throw-off lever 13 has secured to its lower end a bracket 16 to which is pivoted, as by means of a pivot bolt 17 a U-shaped member 18 forming a slideway for a bar 19, one end of which is pivotally secured, as at 20, to the bed of the press, so that said bar is reciprocated as the bed oscillates. The bar 19 has its outer surface notched as at 21 to form a shoulder 22 and has an opening 23 extending through the bar from the notch to its inner surface. The function of the shoulder and opening will be presently described.

The throw-off lever also has an opening 24 adjacent its lower end in which is slidably mounted a cylinder 25, the inner end of which is tapered as at 26 to correspond with the taper of the notch 21. Slidably mounted within the cylinder 25 is a plunger 27 having an end 28 of reduced

diameter which is adapted to extend through an opening in the tapered end of the cylinder. The cylinder is closed at its outer end by means of a bushing 29 which is threadedly secured to the cylinder. A compression coil spring 30 is interposed between the bushing 29 and the plunger 27 and is adapted to force the plunger to the position shown in Fig. 4, that is, with the end 28 thereof projecting out of the cylinder. The bushing, by virtue of its threaded connection with the cylinder, is adjustable to vary the tension on the spring 30, and may be locked in adjusted position by means of a lock nut 31.

The cylinder 25 has an annular recess 32 in its outer periphery, into which extends a pin 33 mounted on one arm 34 of a bell crank lever 35. The lever 35 is pivoted as at 36 to the throw-off lever, and the other arm 37 of the lever has pivotally secured thereto an operating link 38. The upper end of the link 38 is pivotally secured as at 39 to a handle 40, which, in turn, is pivotally secured as at 41 to the throw-off lever just below the handle 14 of the latter.

A tension coil spring 42, which interconnects the lever arm 34 and the throw-off lever, normally forces the cylinder 25 to its innermost position, as shown in Fig. 3.

The bushing 29 has a passage 43 extending therethrough, which establishes communication between the interior of the cylinder 25 and a flexible tube 44 connected to a nipple 45 of the bushing. The tube 44 is connected to the suction line 46 of the press feeding mechanism, which line 46 is in turn connected to one side of a double-acting vacuum pump 47, with which the press is provided, and whereby the necessary suction is provided in the line 46. It will be understood that the line 46 provides suction for the pneumatic suction feed device of the press.

The operation of the throw-off mechanism will now be described.

In the normal operation of the press, the suction in the line 44 is sufficient to overcome the action of the spring 30, maintaining the plunger 27 in the position shown in Fig. 5. The bar 19, in its reciprocating movement, slides on the member 18, and does not in any way disturb the throw-off lever, the relative position of the cylinder 25 and the shoulder 22 on the bar 19 when the bed of the press is farthest away from the frame being as shown in Fig. 5. Upon movement of the bed towards the frame, the spring 42 yields sufficiently to permit the bar 19 to force the cylinder 25 outwardly, as the inclined surface of the notch 21 rides past the end of the cylinder.

In the event of failure, for any reason, of the suction in the line 46, the spring 30 will expand, forcing the end 28 of the plunger 27 into the opening 23 of the bar 19 when the plunger and opening are in alignment with each other, as shown in Fig. 4. As a result, the bar 19, on the next movement of the bed of the press towards the platen, will automatically move the throw-off lever 13 to the position shown in dotted lines in Fig. 1, thereby actuating the various links and levers which have been described so that the bed will not contact the platen on the printing stroke of the bed. As the bed continues to oscillate, the throw-off lever will also be oscillated about its pivot, but each time that the throw-off lever moves to the dotted line position, contact of the bed with the platen is precluded.

When the suction or vacuum in the line 46 is reestablished, the plunger 27 will be retracted to the position shown in Fig. 5, by the suction within the cylinder 25. Should the throw-off lever be in the dotted line position when this occurs, it will not be necessary to manually restore the lever to the solid line position, but instead, this will be accomplished automatically by the bar 19, by reason of the fact that the shoulder 22 on the bar engages the adjacent end of the cylinder 25 on the movement of the bed of the press away from the platen, thereby swinging the throw-off lever to the solid line position.

By the movement of the handle 40 towards the handle 14 of the throw-off lever, the cylinder 25 and its enclosed plunger may be manually retracted from the bar 19, thereby permitting the throw-off lever to be moved manually with respect to the bar.

It is thus seen that I have provided means responsive to the failure of the vacuum in the sheet-feeding mechanism of a press for automatically throwing into operation the throw-off lever of the press, as well as means responsive to the reestablishment of the vacuum for automatically restoring the throw-off lever to its inoperative position. In addition, I have provided means for permitting manual movement of the throw-off lever, when desired.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In a printing press of the Gordon type, pneumatic suction means for the sheet-feeding mechanism of said press, a throw-off lever, and means responsive to failure of the suction in said suction means for moving said throw-off lever into operative position, said means comprising a bar pivotally secured to the bed of the press and having an opening therein, a shoulder on said bar, a cylinder slidably mounted in said lever and operative to engage said shoulder when said lever is in operative position, a plunger reciprocal in said cylinder and provided with a protruding end, spring means operative on said plunger to urge said end to enter said opening in said bar, a bushing mounted in said cylinder and adjustable to vary the compression of said spring means when said plunger is retracted, and a suction line connecting the suction feed device of the press with said bushing.

2. In a printing press of the Gordon type, pneumatic suction means for the sheet feeding mechanism of said press, a throw-off lever, and means responsive to failure of the suction in said suction means for moving said throw-off lever into operative position, said means comprising a bar pivotally secured to the bed of the press and having an opening therein, a shoulder on said bar, a cylinder slidably mounted in said lever and operative to engage said shoulder when said lever is in operative position, means for manually reciprocating said cylinder, a plunger reciprocal in said cylinder and provided with a protruding end, spring means operative on said plunger to urge said end to enter said opening in said bar, a bushing mounted in said cylinder and adjustable to vary the compression of said spring means when said plunger is retracted, and a suction line connecting the suction feed device of the press with said bushing.

3. In a printing press of the character described, pneumatic suction means for the sheet-feeding mechanism of said press, a throw-off lever, and means responsive to failure of the suction in said

suction means for moving said throw-off lever into operative position, said means comprising a cylinder transversely and slidably mounted in said lever, a plunger reciprocal in said cylinder and adapted to protrude therefrom, a member secured to said cylinder, spring means between said member and said plunger, said member being adjustable relatively to said cylinder, means connecting said cylinder to the suction line of the feed device, and a bar pivotally secured to the bed of the press and having an opening therein, a shoulder on said bar adapted to engage said cylinder when said lever is in operative position, said opening being operative to engage said plunger when the latter is protruded.

LAWRENCE R. JOHNSON.