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PROOF PRESS

2 SHEETS—SHEET 1



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PROOF PRESS

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This invention relates to a proof press which is used in printing.

In the art of printing, before the form is locked in the regular printing press preparatory to the printing of duplicate sheets, such form consisting of type, cuts and various printing furniture such as used in making up a form, is placed in a proof press and a proof sheet printed therefrom. The proof sheet after printing is examined to note any mistakes which should be corrected, and if such correction is necessary it is done in the form before the regular run of printing therewith takes place.

The present invention is directed to a very useful and novel improvement in proof presses for an easier handling of the single sheet which is printed, avoiding smearing or smudging of the wet ink of the printed characters, and with a ready removal of the printed proof sheet in a substantially perfect condition.

It is a primary object and purpose of the present invention to provide a proof press wherein the sheet of paper which is to be printed is releasably connected with the cylinder, around which it wraps as the cylinder is turned, and the type moved horizontally underneath the cylinder to print upon the upper side of the proof sheet. Novel means are provided for elevating the cylinder so as to lift the printed sheet around it above the surface of the type when the carriage which carries the type is moved back to its initial position which it had before printing. Further, and an important part of the invention, novel and practical means are provided for the releasable connection of the paper sheet to the cylinder, connecting it at one end and drawing the paper around the cylinder as it is turned and as printing occurs, and keeping it at its other end from coming into contact with the inked type after it is printed and while it is being removed from the cylinder.

An understanding of the invention and of the novel structure embodying it, for the attainment of the ends stated, and many others not at this time specifically enumerated, may be had from reference to the following description, taken in connection with the accompanying drawings, in which,

Fig. 1 is a side elevation of the improved proof press of my invention,

Fig. 2 is a fragmentary longitudinal vertical section therethrough,

Fig. 3 is an enlarged transverse vertical section, substantially on the plane of line 3-3 of Fig. 1, looking in the direction indicated,

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Fig. 4 is a fragmentary end elevation of the structure shown in Fig. 3, looking at the right hand end thereof, and

Fig. 5 is a vertical section through the cylinder, substantially on the plane of line 5-5 of Fig. 3.

Like reference characters refer to like parts in the different figures of the drawings.

In the structure disclosed, a horizontal table 1 is supported above the upper end of a suitable supporting framework 2 and may be adjusted with respect to the supporting frame, as indicated in Fig. 2, to level the table when needed. On the table a horizontal carriage 3, in which the form 4 of type, cuts and the like is carried, is mounted for horizontal reciprocating movements. The carriage 3 at one side is provided with a rack 5.

At substantially the middle portion of the carriage and at each side thereof, vertical posts 6 are connected, extending upwardly. Said posts are apertured between their side edges to provide in each a relatively wide vertical space, in the upper portion of which journal blocks 7, one for each of the posts, are mounted for vertical movement. Projecting ears at the lower ends of the journal 7 have each a pivotal connection with a head 8 at the upper end of a short shaft 9 to which, at its lower end, an eccentric housing 10 is secured, one at each side of the machine. Eccentrics 11 are within each of the housings 10. The eccentrics are at the ends of a horizontal rock shaft 12, which at one end is provided with a radially extending arm 13 (Fig. 1), from which a vertical bar 14 extends downwardly to a foot pedal 14a pivotally mounted on the frame 2. It is evident that by depressing the pedal 14a the shaft 12 is rocked, the eccentrics are turned, and the journal blocks 7 elevated short distances.

A hollow elongated shaft 15 passes through said journal blocks 7 and is provided with a crank 16 at one end for turning the shaft. A cylinder 17 is keyed to the hollow shaft and located between the posts 6 and the journals 7. The cylinder at one side has a segment removed for the length of the cylinder between its ends, making an opening 18 (Fig. 5). At this opening and a short distance inwardly from the peripheries of the ends of the cylinder, a horizontal rod 19, parallel to the shaft 15, is secured.

A fixture including two spaced arms 20, an outer horizontal bar 21 connected to or integral with said arms, and an inner horizontal bar 22, is mounted on the shaft 15, the inner ends of the arms 20 having openings for the passing

of the shaft. Said fixture extends into the openings 18 at one side, with the outer bar 21 bearing against a longitudinal edge of the cylinder at one side of the opening. The fixture is securely connected with the cylinder by set screws 23 passing through the arms 20 and threading into suitable lugs or bosses therefor at the inner side of the cylinder, as shown in Fig. 5. A plurality of pins 24, with relatively large heads 25 at their outer ends, pass through the bars 21 and 22 and through openings therefor in the hollow shaft 15. The heads 25 at their inner sides are parallel to the outer side of the bar 21. Coiled springs 26, one around each of the pins 24 between the outer bar 21 and washers seated on cotter pins extending through transverse openings in said pins, serve normally to force said pins radially inward to bring the inner sides of the heads 25 against the bar 21 or, as it is used in service, to clamp one end of a sheet of paper between said heads and the bar 21.

A rod 27 passes through the tubular shaft 15 and is longitudinally movable therein. At the inner end of each of the pins 24 the rod is grooved around it, one side of each groove being of an inclined or conical form, as at 28, so that when the rod is moved longitudinally in one direction, all of the pins are moved outwardly against the springs 26, thus separating the heads 25 from the bar 21. The rod 27 extends beyond the end of the shaft 15 at the side of the machine opposite the crank 16, and has a collar 29 thereon with pins extending from the collar connecting with a fork or yoke at the upper end of a lever 30, which is pivotally mounted between its ends on a bracket 31 carried by the adjacent post 6 (Fig. 4). The lower end portion 32 of the lever is formed as a cam, inclined at its inner side. An arm 33 on the shaft 12, equipped with a roller 34 at its free end, extends outwardly so that the roller rides against the inner inclined side of the lower end portion 32 of the lever.

Accordingly, when the pedal 14a is depressed and shaft 12 rocked, the arm 33 moves clockwise (Fig. 4) to swing the lever 30, thereby moving rod 27 lengthwise of the shaft 15 and simultaneously elevating all of the heads 25 of pins 24 above the upper side of the bar 21.

A disk 36 is keyed to the hollow or tubular shaft 15 at one end thereof and has a pin 27 extending radially beyond its periphery at one point. A flat gear 38 is mounted loosely to turn about the axis of the shaft 15 and is located between the disk 36 and the adjacent end of the cylinder. The teeth of the gear 38 are in mesh with the rack 5. Two spaced pins 39 extend laterally from the gear 38 and are in the path of movement of the pin 37. As an example, referring to Fig. 4, with a cylinder turned in the direction indicated by the arrow, the cylinder and shaft and the disk 36 move in unison, and the pin 37 will be carried from the upper pin 39 through a part of a revolution until it strikes the second pin 39, shown in dotted lines, whereupon the gear 38 will thereafter be turned and the carriage 3 moved longitudinally underneath the cylinder. Such movement of the type form 4 underneath the cylinder will not take place until the cylinder has moved through approximately 120 degrees of a revolution.

A sheet of paper 41 which is to be printed for the proof sheet, laid upon a table 40 to one side of the upper portion of the cylinder, has its end clamped between the heads 25 and the bar 21. The sheet 41 is moved to bring its end between

said heads and bar, the heads having been lifted by forcing the pedal 14a downwardly. The pedal is then released and will return to its upper position. An arm 42 connected with the rock shaft 12 extends downwardly therefrom (Fig. 2) and has one end of a rod 43 pivotally connected therewith, the other end of the rod being guided through an opening in a frame bar 44. A coiled compression spring 45 around the rod between said bar and the pivoted end yoke which connects the rod to the lever 42, is compressed when pedal 14a is depressed and serves to lift the pedal, rock the shaft 12 back to its initial position, and free the rod 27 to return to the position from which it has been moved, the inner ends of the spring-actuated pins 24 riding upon the inclined surfaces at 28 to move said rod back to the position shown in Fig. 3, and bring the heads 25 into clamping engagement against the end of the paper inserted thereunder.

With the paper thus held and connected with the cylinder, the crank 26 is turned so as to move the cylinder (clockwise in Fig. 5). During the first part of the turning of the shaft, or approximately one-third of a revolution of the cylinder, the paper is drawn over the cylinder and downwardly toward the type at 4 with the gear 38 at rest. But the gear is connected with the disk 36 when the pin 37 has traversed the distance between the two pins 39, so that the carriage 3 is moved underneath the cylinder and the type reaches the paper at or shortly after its clamped end comes into proper position to receive the type imprints. The cylinder is turned until the paper has received the type impressions and may be carried farther until the free end of the paper comes to the upper side of the cylinder where it is accessible for grasping by the fingers of the operator. Then by depressing the pedal 14a the cylinder is lifted and the clamped end of the paper released for removal from the cylinder by turning the cylinder backward. Of course, the return of the type and the carriage which carries it to initial position will be with the cylinder elevated so that no type impression is made on the return of the carriage and type to such initial position.

The rod 19 may serve as a support for one end of a covering for the outer surface of the cylinder, said covering being connected to the rod, wrapped around the cylinder and clamped at its other end and between a side of the bar 21 and the adjacent edge of the opening 18 through the cylinder.

The construction described is very practical and useful and insures a certainty of production of a clean, unsmudged proof sheet. The machine construction is of a sturdy and durable character, with no parts liable to get out of order, and in practice has proven exceptionally satisfactory.

The invention is defined in the appended claims and is to be considered comprehensive of all forms of structure coming within their scope.

I claim:

1. In a structure as described, a support, a horizontal hollow shaft mounted for rotation on said support, a cylinder secured to said shaft, said cylinder having a longitudinal opening at a side thereof, a bar secured to the cylinder against an edge of the opening, headed pins extending radially through the bar and at their inner ends passing through said hollow shaft, springs, one on each pin, normally moving said pins inwardly, a rod extending lengthwise of said hollow shaft having a plurality of grooves around it, one for each pin, into which grooves the pins normally

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extend, one side of each of said grooves being of a conical form, bearings for the shaft, means for slidably mounting said bearings for vertical movement, a rock shaft mounted on the support below said hollow shaft, eccentric connections between said rock shaft and the hollow shaft for raising and lowering said hollow shaft and cylinder on rocking the rock shaft, and means between said rock shaft and rod for simultaneously moving the rod lengthwise to force said headed pins outwardly when the shaft is rocked and the cylinder raised.

2. A structure as defined in claim 1, said means between the rod and rock shaft comprising, a lever pivotally mounted between its ends, connections between one end of the lever and an end of the rod, and an arm secured to and extending radially outward from the rock shaft adjacent the opposite end of the lever, said lever at said opposite end having a cam surface for engagement with said rod to thereby move the rod longitudinally to lift said pins on rocking said rock shaft.

3. In a structure as described, a support, a hollow cylinder mounted thereon for rotation about its longitudinal axis, a horizontal printing form carriage mounted on said support for longitudinal movement under the cylinder, clamping means on the cylinder for releasably securing an edge portion of a sheet of paper to the cylinder when said clamping means is at an upper position on said cylinder, gearing connections between the cylinder and carriage for moving the carriage longitudinally under the cylinder, and manually operable means for simultaneously bodily lifting the cylinder and for operating said clamping means for release of a paper sheet.

4. In a structure as described, a support, a horizontal hollow shaft mounted for rotation on said

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support, a cylinder secured to said shaft having a longitudinal opening at a side thereof, a bar secured to said cylinder against an edge of the opening, a plurality of spaced paper grippers located lengthwise of and against the outer side of said bar, individual means for mounting said grippers on the bar extending therefrom radially through the hollow shaft, spring means normally moving said grippers against the outer side of the bar, bearings for the shaft, means for slidably mounting said bearings on the support for vertical movement, operating means mounted on the support below said hollow shaft, connections between said operating means and the hollow shaft for raising and lowering said hollow shaft and cylinder on operation of said operating means, and means extending lengthwise of the hollow shaft having means thereon for lifting and releasing said grippers, and means between said operating means and said last mentioned means for simultaneously operating said last mentioned means to release said grippers simultaneously with the raising of the cylinder.

FREEMAN BARNEY.

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