Sept. 11, 1934. P. F. COX 1,973,464

FLAT BED WEB PRINTING PRESS

Filed May 22, 1933

Fig. 1.

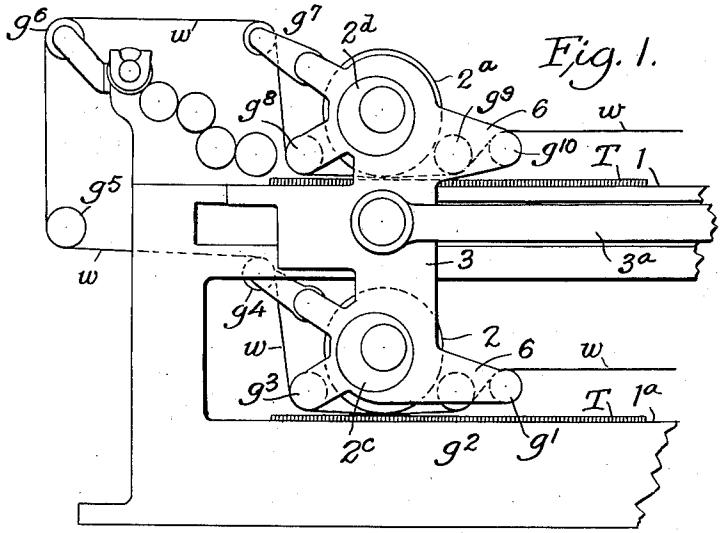


Fig. 5

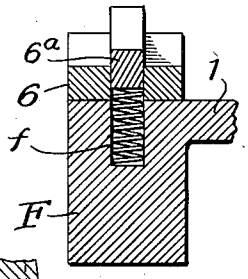


Fig. 2.

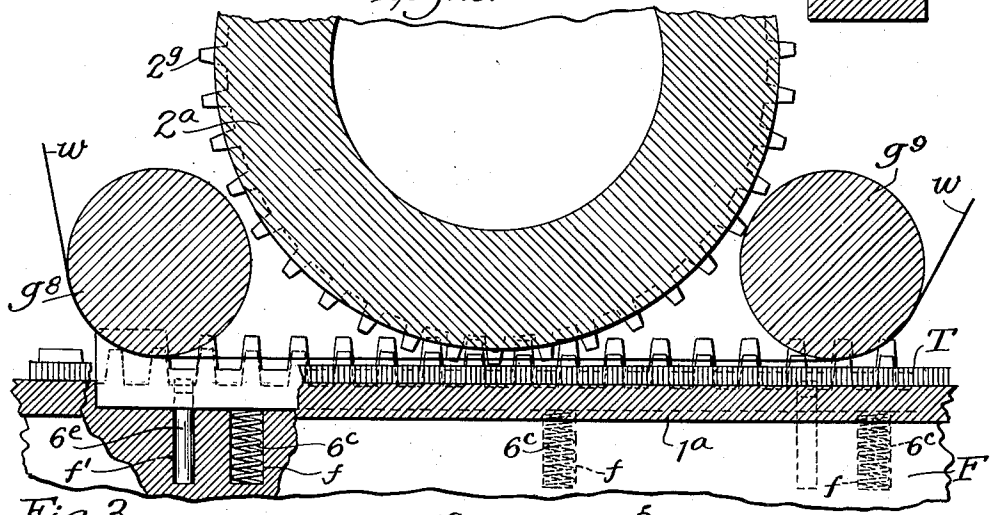


Fig. 3.

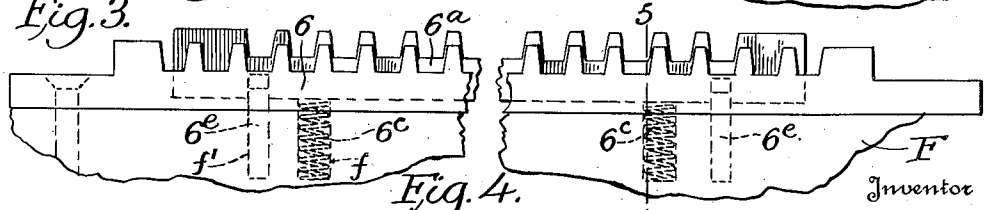
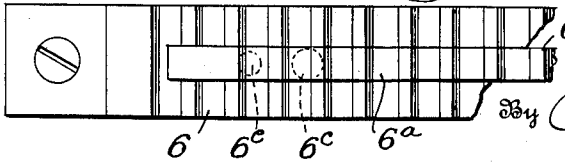


Fig. 4.



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FLAT BED WEB PRINTING PRESS

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Application May 22, 1933, Serial No. 672,303

9 Claims. (Cl. 101—256)

This invention relates to flat bed web printing presses such, for instance, as shown in my Patents Nos. 938,543; 1,475,566 and others.

The object of the invention is to prevent smut or offset from one side of a freshly printed web onto the perfecting impression cylinder, and from the latter onto the opposite side of the web.

For this purpose I provide means whereby when the impression cylinder is thrown off impression the portions of the web underlying the perfecting impression cylinder and between the guide rolls of the opposite sides thereof will be clear of both the cylinder and the type, but the cylinder will be maintained in accurate mesh relation with the bed rack by means of an auxiliary rack section which remains continually in mesh with the cylinder gear but raises and lowers in accordance with the movement of the cylinder to "off" and "on" impression positions, such rack section preventing back lash and also preventing the cylinder from becoming disengaged or out of time with the bed rack when raised high enough to permit the web to pass beneath such cylinder during the web shifting operations without coming into contact therewith.

I will explain one practical embodiment of the invention with reference to the accompanying drawing to facilitate an understanding of the invention by those skilled in the art. In the claims the essentials of the invention and the novel features of construction and novel combinations of parts for which protection is desired, are summarized.

In the drawing:

Fig. 1 is a diagrammatic side elevation of part of a flat bed web printing press equipped with my invention.

Fig. 2 is an enlarged diagrammatic view partly in section showing the parts in positions assumed when the impression cylinder is "off" impression and the web is being shifted thereunder.

Fig. 3 is a detail side view of part of the bed rack and movable rack section.

Fig. 4 is a top plan view of part of the bed rack.

Fig. 5 is a transverse section on the line 5—5, Fig. 3.

The type of press shown in the drawing and in the patents referred to has parallel type beds 1, 1*a* arranged one over the other in a suitable main frame. Cooperating with these beds are traveling impression cylinders 2, 2*a*, mounted in eccentric bearings 2*c*, 2*d* in crossheads 3 which are supported in guideways in the side frames of the press and are reciprocated to move the cylinders 2 and 2*a* back and forth over the beds, by means of pitmen 3*a* connecting the crossheads with crank gears (not shown). By rocking the eccentrics 2*c*, 2*d* the cylinders are thrown "on impression" during one stroke of the crossheads and thrown "off impression" during the other stroke.

The web *w* may be fed from a web roll, not shown, and directed by suitable means to and over a guide *g'* and under guide g^2 on the crossheads adjacent cylinder 2, then under the cylinder to a roller g^3 on the crosshead and thence up over a guide g^4 on the crosshead beside cylinder 2; thence out over a stationary guide g^5, mounted on the press frame; up over a guide g^6 on the frame; thence inwardly to and over a guide g^7 on the crossheads adjacent cylinder 2*a*; down under guide g^8 beside cylinder 2*a* to a guide g^9 on the crosshead at the opposite side of cylinder 2*a* and up over guide g^{10} and thence to the web delivery devices.

When the cylinders are "on impression" and moving across the beds 1, 1*a*, the web is stopped between the feed and delivery by the action of devices (not shown). While the cylinders are "off impression" the web is shifted forward by said devices. The general construction and arrangement of the aforesaid parts and the operation thereof are well known, and may be as shown and described in my aforesaid patents; and therefore need no further detailed illustration or explanation herein.

The first printed side of the web would ordinarily come into contact with the surface of the impression cylinder 2*a* and some of the fresh ink on the web would adhere to the surface of the cylinder and "smut" the same; and such "smut" being pressed by the cylinder onto the web passing thereunder produces "offset" and spoils the appearance of the perfected sheet.

To prevent this smutting I so locate the guide rolls g^8 and g^9 on the crossheads that the lower peripheries thereof are in a plane slightly above the plane of the printing surface of the type T on the bed 1*a*, and slightly below the plane of the lower periphery of the cylinder 2*a* when the latter is raised or "off impression" position, as indicated in Fig. 2, so that the web *w* passing between the rolls g^8 and g^9 during the shifting operation will not contact with the cylinder nor with the type (see Fig. 2), and therefore during the shifting of the web between impressions the printed side of the web does not contact with the periphery of the cylinder 2*a* and the latter will not be smeared or smutted.

In Fig. 1 the cylinder is shown "on impression", but in Fig. 2 the cylinder is shown "off impression" and raised high enough so that the web does not touch the cylinder while being shifted, and the guide rollers g^8 and g^9 are placed high enough to permit the web to be shifted without touching the type form.

In order to permit the cylinder 2*a* to be raised high enough to avoid smutting of the web during the shifting thereof yet maintain a constant and true pitch line mesh position with relation to the bed rack, I provide an auxiliary bed rack or section 6*a*, which is preferably mounted within a longitudinal slot in the bed rack 6, see Figs. 3–5. The auxiliary rack 6*a* is toothed similar to the bed rack 6 and when the auxiliary rack is in lowered or depressed position its teeth exactly coincide with the teeth of the bed rack 6. The auxiliary rack 6*a* is made vertically movable so that it can raise as and when the cylinder rises to "off impression", and can be lowered by and with the cylinder gear when the cylinder is on impression. The auxiliary rack may be raised and lowered by any suitable means. As shown it is raised by means of springs 6*c* inserted in recesses *f* in the adjacent side members F of the press (Figs. 2 and 5). The auxiliary rack may be accurately guided in its vertical movements by pins 6*e* attached thereto and engaging sockets *f'* in the member F. The springs cause the auxiliary rack to follow the cylinder 2*a* when it rises off impression and as the teeth of auxiliary rack 6*a* remain constantly in mesh with the cylinder gear 2*g* prevent any back lash of the cylinder and keep it accurately timed in relation to the bed rack while rising or lowering and while in its raised or "off impression" position, and allows such cylinder to be raised high enough to clear the web between the cylinders g^8 and g^9 and while such web is being transferred through the press.

While the invention is primarily designed for use in flat bed web perfecting presses of the character set forth it is applicable to other types of bed and cylinder machines in which the printing mechanism is "thrown off impression" during the shifting of the web or sheet.

I claim:—

1. In a bed and cylinder web printing press having a cylinder and bed, a bed rack, a cylinder gear meshing with the bed rack, guides for directing a web between the cylinder and bed, and means for throwing impression on and off; an auxiliary rack extending lengthwise of and vertically movable relative to the rack and to and from the cylinder and engaging the cylinder gear and means for keeping the auxiliary rack in mesh with said gear, whereby the cylinder is kept in accurate mesh relation with the bed rack when the impression is thrown off.

2. In mechanism as set forth in claim 1, the bed rack being longitudinally slotted and the auxiliary rack being movably mounted in the slot of the bed rack.

3. In a press as set forth in claim 1, the web guides at opposite sides of the cylinder having their lower peripheries disposed in a plane slightly above the plane of the printing surface and slightly below the plane of the cylinder when it is thrown "off impression".

4. In a bed and cylinder web printing press having a cylinder and bed, a bed rack, a cylinder gear meshing with the bed rack, guides for directing a web between the cylinder and bed, and means for throwing impression on and off; an auxiliary rack extending lengthwise of and vertically movable relative to the rack and to and from the cylinder and engaging the cylinder gear, and means for keeping the auxiliary rack in mesh with said gear whereby the cylinder is kept in accurate relation with the bed rack when the impression is thrown off, the web guides adjacent the cylinder being so disposed that when the impression is thrown off the web passing between said guides is clear both of the periphery of the cylinder and the printing surface.

5. In mechanism as set forth in claim 4, the bed rack being longitudinally slotted and the auxiliary rack being movably mounted in the slot of the bed rack.

6. In a flat bed and traveling cylinder web printing press having means for reciprocating the cylinders over the beds and web guides for directing web successively between the beds and cylinders including guides mounted on the crossheads at opposite sides of the cylinders, and means for throwing the cylinders on and off impression; an auxiliary bed rack extending lengthwise of and movable relative to the rack and to and from the perfecting cylinder and engaging the cylinder gear, and means for keeping the auxiliary rack in mesh with said gear, whereby the cylinder is kept in accurate relation with the bed rack, the parts being so disposed that when the cylinder is thrown off impression the web passed between the guides is free both of the peripheries of the cylinder and the type of the printing surface.

7. In mechanism as set forth in claim 6, the bed rack for the perfecting cylinder being slotted and the auxiliary rack movably mounted in the slot of said bed rack.

8. In a flat bed and traveling cylinder web printing press having means for reciprocating the cylinders over the beds, longitudinally slotted bed racks, cylinder gears meshing with the bed racks, guides for directing web successively between the beds and cylinders including guides mounted on the crossheads at opposite sides of the cylinders, and means for throwing the cylinders on and off impression; an auxiliary mounted in the slot in the perfecting cylinder bed rack and movable relative to the bed rack to and from the perfecting cylinder and engaging said cylinder gear, and means for yieldingly holding said auxiliary rack in engagement with said gear, whereby said perfecting cylinder is kept in accurate relation with the bed rack when thrown off impression; the parts being so disposed that when the perfecting cylinder is thrown off impression the web passing thereunder is clear both of the periphery of the cylinder and the printing surface.

9. In a single acting stationary bed and traveling cylinder press having means whereby impression is thrown off during one stroke of the cylinder; a gear on the cylinder, a compound bed rack meshing with said gear and comprising a fixed gear portion and a movable gear portion aligned with the fixed gear portion, and means for holding the movable portion yieldingly in full mesh engagement with the cylinder gear both during the impression and while the impression is thrown off.

PAUL F. COX.