

B. F. UPHAM.
PRINTING PRESS.

APPLICATION FILED MAY 5, 1909. RENEWED APR. 4, 1911.

1,009,115.

Patented Nov. 21, 1911.

2 SHEETS—SHEET 1.

Fig. 1

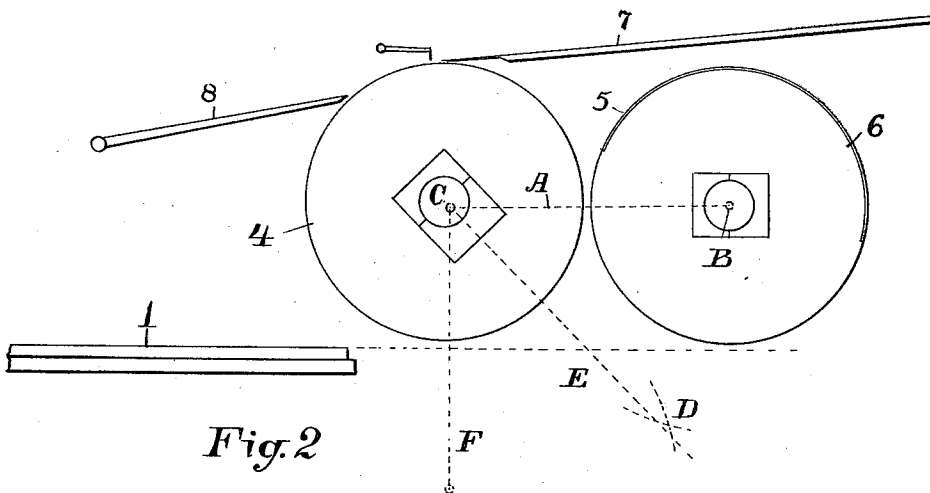
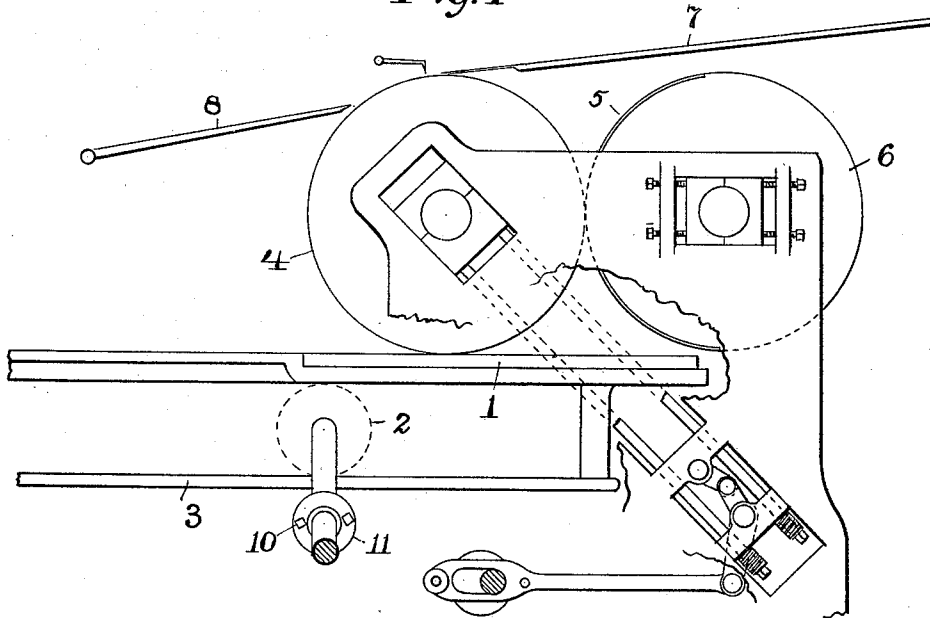


Fig. 2

Witnesses:
E. W. Waite
M. W. Upham.

Inventor,
Burt F. Upham;
By A. B. Upham,
Attorney.

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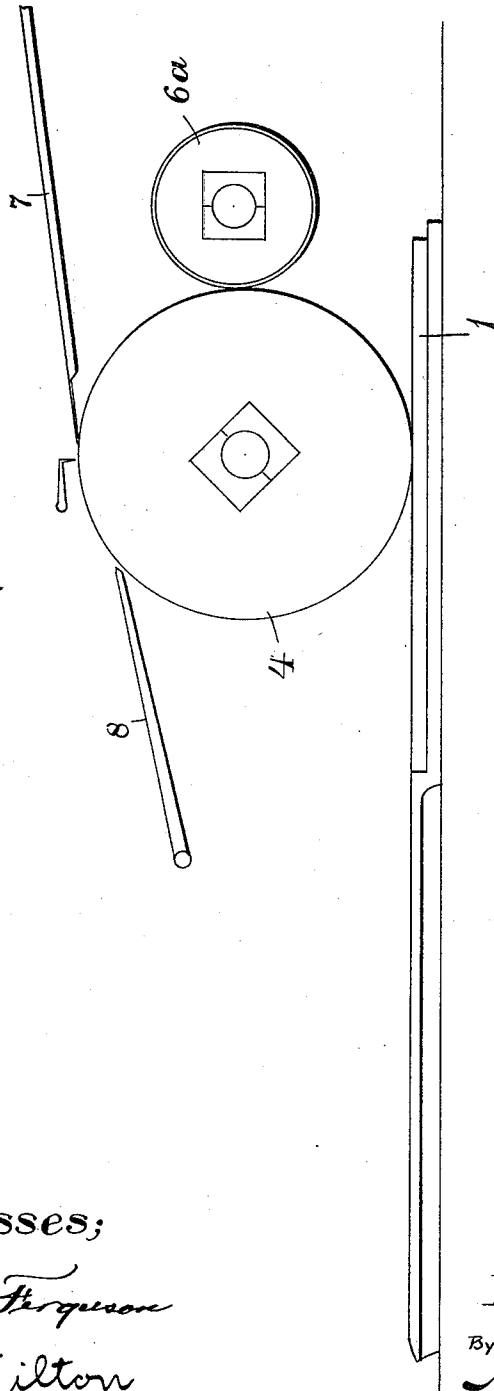


Fig. 3

Witnesses;

Joell Ferguson
E. J. Tilton

Inventor,

Burt F. Upham;

By *A. B. Upham,*
Attorney.

UNITED STATES PATENT OFFICE.

BURT F. UPHAM, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO SOUTHGATE MACHINERY CO., OF BOSTON, MASSACHUSETTS, A CORPORATION.

PRINTING-PRESS.

1,009,115.

Specification of Letters Patent.

Patented Nov. 21, 1911.

Application filed May 5, 1909, Serial No. 494,154. Renewed April 4, 1911. Serial No. 618,920.

To all whom it may concern:

Be it known that I, BURT F. UPHAM, a citizen of the United States, and a resident of the city of Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Printing-Presses, of which the following is a specification.

The object of this invention is the construction of an improved two-revolution flat-bed two-color press, and one which, by disconnecting the bed, can be converted into a sheet-rotary press.

In Patent No. 909,260, I have disclosed a press of this type wherein the above-described functions were performed by attaching to an ordinary bed-and-cylinder machine an auxiliary printing cylinder of substantially less diameter than the impression cylinder, and in contact with the latter but just above the path of the bed, wherein the elevation of the impression cylinder to put it out of engagement with the printing surface also carries it out of touch with said printing cylinder. In said press, it is necessary to have the auxiliary printing cylinder considerably less in diameter than the impression cylinder in order that it may come sufficiently below the overhanging periphery of the impression cylinder to have the latter recede therefrom in its elevation.

In this present invention, I have devised means whereby an auxiliary printing cylinder can be employed substantially equal in diameter to the impression cylinder. To do this, the last-named cylinder is given an oblique rise and fall, its movement being practically in a plane inclined at an angle of forty-five degrees with the horizon.

Referring to the drawings forming part of this specification, Figure 1 is a side elevation, mainly in diagram, with parts broken away, of a printing press embodying my invention. Fig. 2 is a similar view in diagram, showing the impression cylinder in its raised position. Fig. 3 is a modified form.

The bed 1 is of the usual form and reciprocated in a well-known way, as by the vertically-swinging spur gear 2 meshing with the two-faced rack 3 carried by the bed. In Fig. 1, the impression cylinder 4 is shown in its depressed position engaging said bed, and equally in contact with the printing surface or plate 5 carried by the printing cylinder 6. In Fig. 2, the impression cylinder is

represented in its raised position, and hence out of engagement with both the bed and printing cylinder.

The printing cylinder being of the same diameter as the impression cylinder, and also slightly raised to keep it out of contact with the bed, a line, as A cutting its axis B and the axis C of the impression cylinder when in its lowermost position, will be hardly horizontal, as indicated in Fig. 2. This line will pass through the points of said cylinders' engagement. Another line F dropped from the axis C perpendicularly to the bed will cut the points of engagement between the cylinder 4 and the printing surface on said bed. Midway between these two lines would appear to be the line of movement to be given to the impression cylinder, as at the intersection of the arcs D. This is found not to be strictly true, however, for the reason that in the one case there is an engagement between a flat surface and a curved surface, and the other is between two curved surfaces. Consequently, with equal pressures in the two cases, the latter would more deeply emboss the printed sheet. To obviate this and perfectly equalize the two printing pressures, I do not run the line of direction E for the movement of the impression cylinder 4 through said intersection D, but have it more nearly vertical, just enough to give the heavier impression to the flat printing surface.

The flat printing surface and the cylindrical printing surface being each provided with ink of the desired color, the sheet fed to the impression cylinder from the feed board 7 will be carried about said cylinder and delivered to the delivery device 8 in the usual manner, but on its way it will be given the two desired impressions in the two selected colors of ink.

To convert the press into a single-impression, high speed rotary, sheet-delivery machine, it is only necessary to disconnect the bed-reciprocating mechanism, as by removing the bolts 10 of the shaft coupling 11, and leave the bed at its outer extremity of position, as shown in Fig. 2; after which the two cylinders can be speeded up as fast as the operator can feed to them, and the two act upon the paper in conjunction, unimpeded by the necessarily slower movements of the bed.

In Fig. 3 I show a modified form of my

invention wherein the auxiliary printing cylinder 6^a is substantially smaller than the impression cylinder 4, but whose axis is located at practically the same level as that of the impression cylinder. Otherwise the construction is precisely the same as that previously described. By thus having the auxiliary cylinder 6^a substantially smaller than the impression cylinder 4, and locating it at a considerable distance above the bed, ample room is allowed in reaching the latter from the rear of the press. This is not possible in the press set forth in my said Patent 909,260, nor in the construction above described, where the impression cylinder and auxiliary cylinder are of equal diameters. Hence in some respects, the form of press illustrated in Fig. 3 is superior to either of the others referred to. It is, of course, evident that a small auxiliary cylinder located with its axis in the same horizontal plane with the impression cylinder requires the latter to be withdrawn from the bed at about the same angle of inclination as is done when the cylinders are of equal size.

What I claim as my invention and for which I desire Letters Patent is as follows, to wit:—

1. A printing press comprising a reciprocating bed, a two-revolution impression cylinder having a throw-off movement coacting therewith, and an auxiliary printing cylinder having its axis in substantially the same horizontal plane with the axis of the im-

pression cylinder, the impression cylinder having its plane of movement substantially inclined with respect to the surface of the bed, whereby the impression cylinder will properly withdraw its surface from both the bed and the auxiliary cylinder.

2. A printing press comprising a reciprocating bed, a two-revolution impression cylinder having a throw-off movement coacting therewith, and an auxiliary printing cylinder substantially equal in diameter to the impression cylinder located close above the path of said bed; said impression cylinder's line of movement being substantially inclined with respect to said bed.

3. A printing press comprising a reciprocating bed, a two-revolution impression cylinder having a throw-off movement coacting therewith, and an auxiliary printing cylinder substantially equal in diameter to the impression cylinder located close above the path of said bed; said impression cylinder's line of movement being inclined at approximately forty-five degrees with respect to said bed, but such line being more nearly vertical than toward the line joining the axes of the two cylinders.

In testimony that I claim the foregoing invention, I have hereunto set my hand this 24th day of April, 1909.

BURT F. UPHAM.

Witnesses:

PERCY G. SHAW,
ROY D. LAMB.