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W. F. HUCK

2,097,067

MULTICOLOR WEB PRINTING MACHINE

Filed June 19, 1935

2 Sheets-Sheet 1

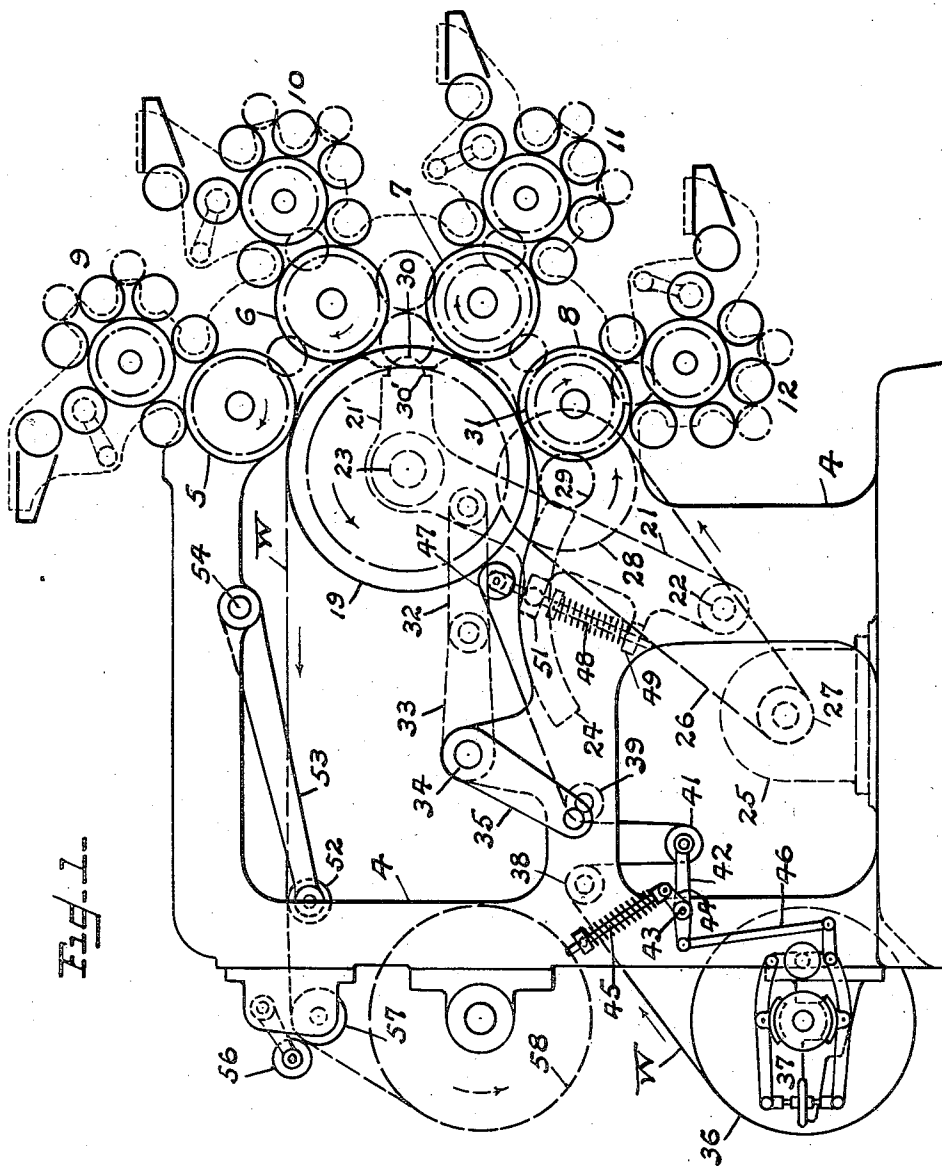


Fig. 1

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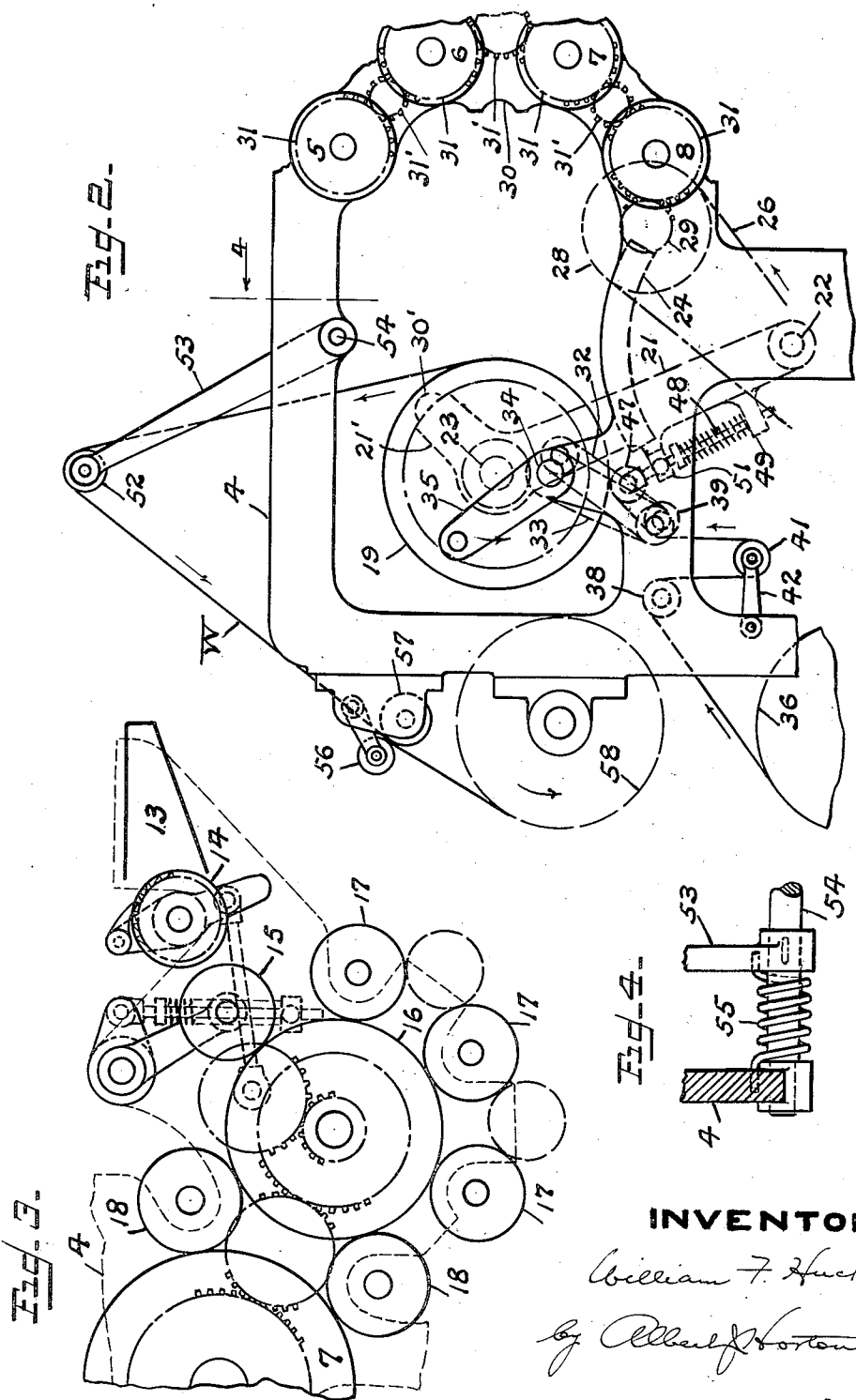
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2 Sheets-Sheet 2



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MULTICOLOR WEB PRINTING MACHINE

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by mesne assignments, to R. Hoe & Co., Inc.,
New York, N. Y., a corporation of New York

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8 Claims. (Cl. 101—182)

This invention relates in general to printing machines and more particularly to a multi-color printing machine, having for its object the provision of novel means permitting the tripping of the impression of a plurality of form cylinders of a printing machine by moving a single coating impression cylinder, and then, by further movement of the same impression cylinder, permitting access to the several form cylinders for plating and, when required, for cleaning, adjustments, etc.

Another object is to provide, in a device of the type indicated, an impression cylinder adapted to coat with a plurality of form cylinders and of a size such that any point on any of the forms will engage the same place on the impression cylinder only after a considerable number of revolutions, thus minimizing wear and prolonging the life of the rubber covering the said impression cylinder.

It is also an object of the invention to provide a multi-color printing machine of generally improved construction, whereby the device will be simple, durable and inexpensive in construction, as well as convenient, practical, serviceable and efficient in its use.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts, and in the details of construction hereinafter described and claimed, it being understood that various changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

The preferred embodiment of the invention is illustrated in the accompanying drawings, wherein:

Figure 1 is an end elevational view of a multi-color printing machine embodying the invention and showing the impression cylinder in normal coating relation with a plurality of form cylinders;

Figure 2 is a fragmentary end elevational view, similar to Figure 1, but showing the impression cylinder moved or tripped out of operative connection with the form cylinders;

Figure 3 is a fragmentary end elevational view of certain members of the ink conveying mechanism; and

Figure 4 is an enlarged fragmentary detail view of the resilient means employed for biasing the tension roll supporting arm.

In the drawings, wherein similar characters of

reference indicate corresponding parts in the several views of the preferred form of the invention, 4 designates generally the frame of a printing machine whereon a plurality of form cylinders 5, 6, 7 and 8 are rotatably mounted. Each of the form cylinders has coaxially associated therewith inking mechanism, designated generally at 9, 10, 11 and 12 for the respective cylinders, and illustrated more fully in Figure 3 wherein 13 designates an ink fountain from which ink is conveyed via an intermittently operated fountain roller 14, pick-up roll 15, ink drum 16, ink distributing rolls 17 and form rollers 18 to the adjacent form cylinder. As the details of the inking mechanism form no part of the present invention, they need not be further referred to here.

According to an important feature of the present invention, all of the form cylinders are coaxially engaged with a single impression cylinder 19 which is so mounted as to be bodily movable into and out of coating operation with all of the said form cylinders. The means for supporting the impression cylinder 19 in adjustable relation to the form cylinders comprises a pair of arms or supporting members 21, one at each end of the frame 4 and fastened to a shaft 22 rotatably mounted therein, the shaft 23 of the impression cylinder being journaled in the said arms 21. Only one of the members 21, each of which contacts an adjacent arcuate guide plate or face 24 provided on each side of the frame 11, is illustrated, it being understood that the construction shown at one end of the machine, is duplicated at the other end. The impression cylinder 19 and the coating form cylinders, together with their respective inking mechanisms are operatively connected through a train of interengaging gears, indicated in dotted lines in Figure 1, and driven from a motor 25 via a chain 26, sprocket wheels 27, 28 and gear 29, which meshes with a gear 31 on the hub of the adjacent form cylinder 8. Each of the other form cylinders is also provided with a gear 31, all of which latter are in turn operatively connected to and driven by intermediate gears 31', as best shown in Figure 2.

To an upper portion of each of the members 21, one end of a link 32 is pivotally attached, the other end of the said link being pivoted to an arm or link 33 fastened to a shaft 34 rotatably supported in the frame 4 and having secured thereto an operating handle 35. The links 32, 33 serve as toggle levers by means of which the impression cylinder, through the intermediary of the arms

21 and the handle 35, is swung into and out of cooperation with the several form cylinders.

As best shown in Figure 2, the frame 4 of the machine is provided with a socket 30 wherein is registering received an extended portion 30' formed on a lateral projection 21' of each arm 21, when the impression cylinder 19 is swung from the inoperative position (Figure 2) to the operative position shown in Figure 1.

The web W supplied to the printing machine, as best shown in Figure 1, is fed from a roll 36 which is coupled to a suitable automatically-governed web tension mechanism indicated generally at 37. From the roll 36, the web is led over rollers 38, 39 including the floating or drop roller 41, which latter is mounted on a lever arm 42, pivoted on a stud 43, to which is fastened an arm 44, biased by a spring rod 45, slidably supported on the frame 4. The lever arm 42 is pivoted to a link 46, connected to the web tension mechanism 37, the association of parts being such that when the drop roller moves in accordance with variations of tension in the web, the automatic tension mechanism will compensate for said variations and thereby maintain constant tension over the traveling web.

From the roller 39, the web is led over a roller 47 mounted on the upper end of a spring rod 48 slidably mounted in poppets 49, 51 fastened to each of the arms 21. The roller 47 maintains the wrap of the web about the impression cylinder 19 in order to rotate the latter at the same peripheral speed as the web and the coacting form cylinders. After receiving the color impressions from the several form cylinders, the web is next led over a roll 52, rotatably mounted on an arm 53, fastened to a shaft 54, journaled in the frame 4. The arm 53 is biased by a tension spring 55, fastened at one end to the frame and at its other end to the said arm 53, so that, as will be seen by inspection and comparison of Figures 1 and 2, slack in the web W will be taken up when the impression cylinder is moved away from the form cylinders to the inoperative position shown in Figure 2. The web W after passing over the roller 52 is directed between guide rollers 56, 57 to the rewind roll 58.

The operation of the machine may be summarized as follows:

Assuming it is desired to trip the impressions of the several form cylinders in order to clean, adjust or replate same, etc., the operating lever 35 will be swung in a counter-clockwise direction, thereby angling the toggle links 32, 33 from the position shown in Figure 1 to that shown in Figure 2, and consequently, swinging the arms 21 carrying the impression cylinder 19 to the left. During the operation last described, it will be observed that the web-contacting roller 47 will move with the arm 21 and maintain pressure at all times on the web to lead it against the said impression cylinder to keep the web from slipping on same.

To return the impression cylinder back to operative position, the lever 35 is turned in a reverse or clockwise direction, this resulting in bringing the extended portions 30' on the arms 21 into the sockets 30, and the impression cylinder into coacting relation with the several form cylinders, as indicated above.

The present device is particularly advantageous when a web of comparatively narrow width is employed since the operator, after the impression cylinder has been swung to a distance comparatively remote from the form cylinders, has con-

venient access to all of the plurality of form cylinders and ample space to replate, adjust or clean same. In all positions of the impression cylinder and while same is being moved, slack in the web will be taken up both in order to prevent contact of same with adjacent parts and consequent soiling or smudging, and also to prevent slippage of the web on the impression cylinder.

It will be understood that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and it is therefore desired that the present embodiment be considered in all respects as illustrative and not restrictive, reference being had to the claims rather than to the foregoing description to indicate the scope of the invention.

What I claim is:

1. In a printing machine having a plurality of form cylinders, inking mechanism for each of said cylinders, a single impression cylinder, and means for guiding a web between the form cylinders and the impression cylinder; a movable support for said impression cylinder, and means for taking up slack in the web while the impression cylinder is moved from an operative to an inoperative position.

2. In a printing machine having a plurality of form cylinders, inking mechanism for each of said cylinders, and an impression cylinder adapted to simultaneously engage all of said impression cylinders; means for guiding a web between the impression cylinder and the form cylinder, other means for maintaining the web constantly in operative contact with the impression cylinder, and additional means for taking up slack in the web when the impression cylinder is moved against and away from the form cylinders.

3. In a printing machine having a plurality of form cylinders, inking mechanism for each of said cylinders, a single impression cylinder, and means for guiding a web between the form cylinders and the impression cylinder; a swingable support for said impression cylinder, means for swinging the support to move the impression cylinder, and means for retaining the impression cylinder in operative relation to the form cylinders.

4. In a web color press having a frame, a plurality of form cylinders mounted on the frame, a comparatively large impression cylinder, means movably mounted on the frame and adapted to move the impression cylinder into and out of engagement with the form cylinders, means for guiding a web into engagement with the said impression and form cylinders, other means for maintaining the wrap of the web about a portion of the impression cylinder, and a member for biasing the web to take up slack therein when the impression cylinder is bodily moved against and away from the form cylinders.

5. In a web color press having a frame, a plurality of form cylinders rotatably mounted on the frame, an impression cylinder normally engaged with all of said form cylinders, but adapted to be bodily moved into and out of engagement with same, means swingably mounted on the frame for supporting the impression cylinder in operative and inoperative positions, web guiding means for conducting a web between the impression and form cylinders, toggle means for actuating the first mentioned means, and registering means for retaining the swingably mounted means in operative relation to the form cylinders.

6. In combination with the frame, form cylinders and coacting single impression cylinder of

a web color press; means pivotally mounted on the frame for supporting the impression cylinder, manually operable toggle means for moving the means supporting the impression cylinder, and spring-biased means for maintaining the wrap of the web about a portion of the impression cylinder and for taking up slack in the web when the impression cylinder is moved away from the form cylinders and then again into operative engagement with same.

7. In a web color press having a frame, an impression cylinder having a web wrapped about a portion thereof, a plurality of form cylinders disposed about the impression cylinder in position to normally have the web pressed there-against by said impression cylinder, swingable means upon which said impression cylinder is mounted and which is adapted to carry said impression cylinder toward and away from the form cylinders, releasable means to retain said

impression cylinder in position to press the web against all of said form cylinders, and means to maintain the web in contact with the impression cylinder in any of the positions it is moved into by said swingable means.

8. In a web color press having a frame, an impression cylinder having a web wrapped about a portion thereof, a plurality of form cylinders disposed about the impression cylinder in position to normally have the web pressed there-against by said impression cylinder, swingable means upon which said impression cylinder is mounted and which is adapted to carry said impression cylinder toward and away from the form cylinders, and spring biased means carried by said swingable means and adapted to maintain the wrap relation of the web about the impression cylinder in any of the positions it is moved into by said swingable means.

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