

Sept. 5, 1939.

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2,172,279

ALIGNING ARRANGEMENT FOR PRINTING PRESSES

Filed July 1, 1938

2 Sheets-Sheet 1

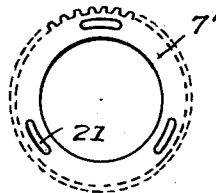
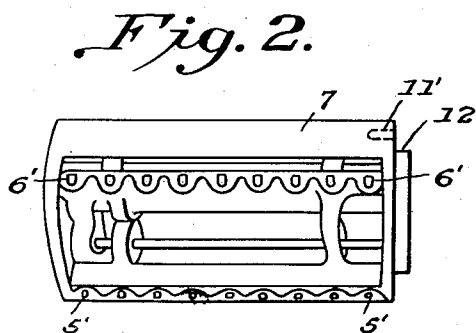
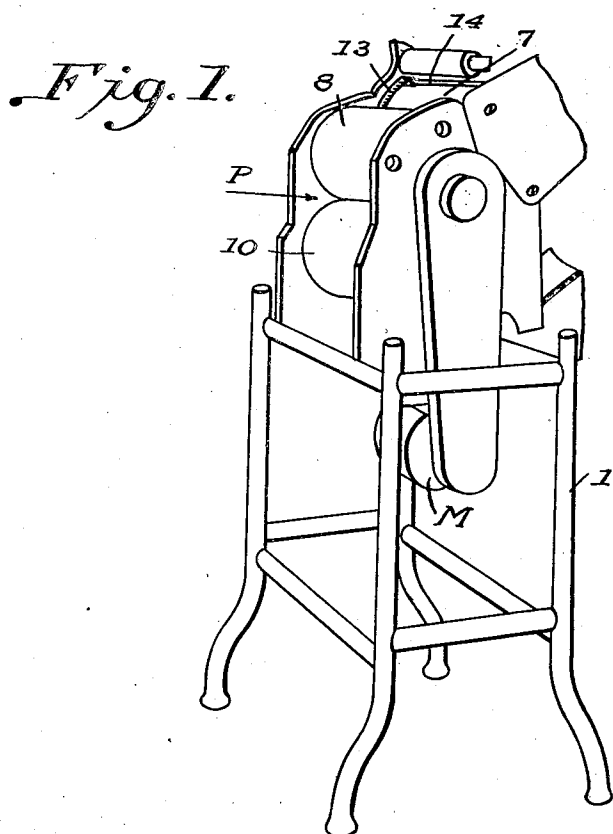


Fig. 3.

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2 Sheets-Sheet 2

Fig. 6.

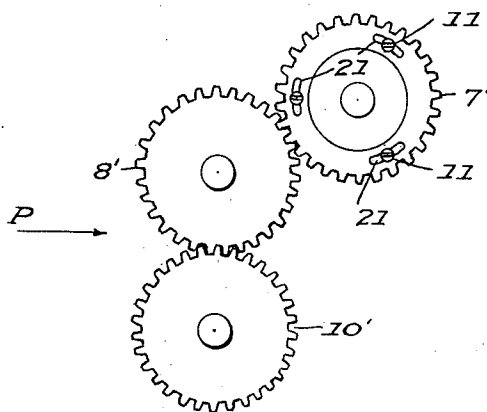
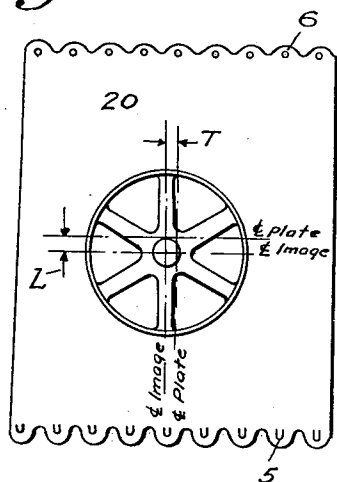


Fig. 4.

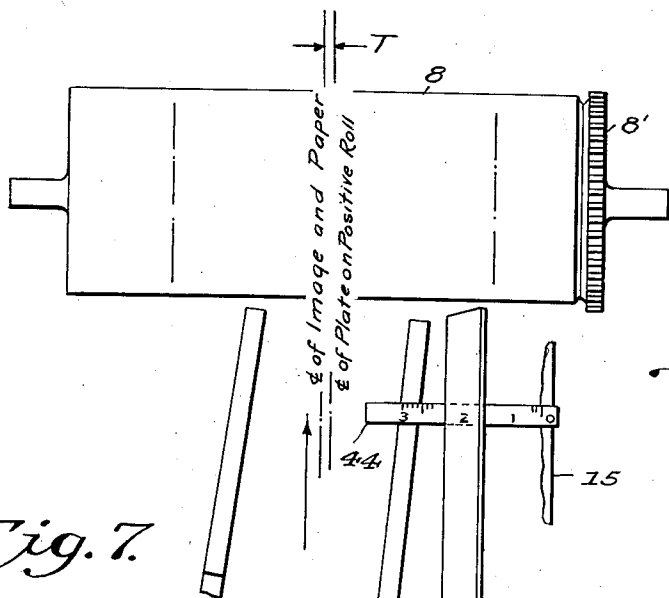


Fig. 5.

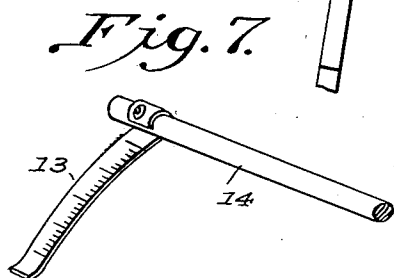


Fig. 7.

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ALIGNING ARRANGEMENT FOR PRINTING PRESSES

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Application July 1, 1938, Serial No. 217,038

2 Claims. (Cl. 101-217)

This invention relates to an aligning arrangement for printing presses and more particularly to a method and apparatus for gaging the impression of printing upon paper sheets as the same pass through a printing press of the Multigraph or Multilith type.

It is the object of the present invention to obtain expeditiously the location of printed matter upon sheets of paper passing through a printing apparatus.

It is a further object of the invention to provide for the alignment of printed matter upon sheets of paper which may be applied to existing machines as well as new machines without any substantial change in construction of the machines with the consequent costs entailed by such changes.

Printing images on paper may be properly aligned or centered by either adjusting the location of the printing plates while the paper is always fed through the machine at the same location, or the feed of the paper may be adjusted while the plate remains fixed. The present invention is based upon the principle that a simplified aligning procedure may be attained by combining these two methods of adjustment, and more particularly by adjusting the plate to obtain a proper location of the printing image longitudinally of the paper and by adjusting the feed of the paper to obtain a proper location of the printing image in a transverse direction.

It is the object of the invention to provide scales of low cost which may be applied to existing machines with ease in order to realize the advantages of the present invention.

Other objects and purposes will appear from the more detailed description of the invention following hereinafter taken in conjunction with the accompanying drawings, wherein:

Figure 1 is a perspective view of a printing machine of the type in which the present invention finds application;

Figure 2 is a front elevation of the printing cylinder;

Figure 3 is a side view of the driving gear attached to one end of the printing cylinder;

Figure 4 is a side view of the machine showing schematically the driving arrangement between the printing cylinder, transfer cylinder and feed cylinder;

Figure 5 is a plan view of the machine showing the capability of the lateral adjustment of the feed of paper;

Figure 6 is a schematic diagram incorporating a plan view of the printing plate and the relation-

ship between the geometric boundaries of the plate and the center-lines of the image; and

Figure 7 is an enlarged view of the arcuate scale and the supporting bar therefor shown generally in Figure 1.

In Figure 1 is shown an example of a Multilith machine supported on a frame 1. The machine consists essentially of a group of cylinders 7, 8 and 10, having attached thereto gear wheels 7', 8' and 10', respectively, which are in driving engagement with each other and which may be actuated by an electric motor M mounted on the frame 1 (Figures 1 and 4). The printing cylinder 7 is adapted to have a metal plate 20 disposed around the periphery thereof. This metal plate is shown in its extended form in Figure 6 and is designed to have an image thereupon coated with a light-sensitive emulsion. The image on this plate is a "positive", similar to images in photographic processes. In view of the fact that it is difficult to obtain the image in the exact center of the plate 20 and then to impress this image in the desired boundaries of a sheet of paper, the present invention is availed of.

As may be seen by an examination of Figures 2 and 6, one end of the metallic plate 20 is provided with apertures 5 which are designed to engage prongs 5' on the printing drum or cylinder 7 which are depressed slightly below the true cylindrical surface of the drum or cylinder 7. Likewise, the other end of the plate 20 is provided with apertures 6 which are hooked onto prongs 6' on the drum. The drum structure permits the movement of the prongs 5' and 6' in order to stretch the thin metal plate tightly thereover, as is well known in the art. As may be seen by Figure 6 showing the superposition of a side view of the printing cylinder upon the printing plate 20, the center-line of the plate is not coincident with the center-line of the image by an amount L in the longitudinal direction of the plate and by an amount T in a transverse direction of the plate. These eccentricities are compensated for by the adjustments described below.

The positive image on the plate 20 mounted upon the printing cylinder 7 is transferred to the transfer roll 8 upon which printing ink may be applied and the negative therefrom is transferred to the sheets of paper P which are fed therebetween and the feeding roller 10 in the direction indicated by the arrow in Figures 1 and 4. In view of the fact that the paper always enters the bite of rolls 8 and 10 along the line where the rolls come in contact, it is readily apparent that com-

pensation must be made for the off-center position of the image on the plate by either adjusting the point of entry of the paper or the angular location of the image with respect to the paper feed. The present invention utilizes the latter mode of adjustment by varying the angular relation of the printing cylinder 7 in order to permit an angular adjustment of the roll 7 with respect to the gear 7' which is fixed by the driving arrangement described above. The gear 7' fits upon the roll offset 12 (Figures 2 and 3) and the former is provided with arcuate slots 21 which permit the movement of the printing cylinder 7. When the desired adjustment is attained, the bolts 11 are tightened and a rigid connection is made between the gear 7' and the printing cylinder 7.

An arcuate scale member 13 is mounted upon a bar 14 extending between the side frames of the machine. The scale extends above a portion of the periphery of the printing cylinder 7 with the plate 20 thereupon. The scale conforms substantially to the curvature of the printing cylinder 7 and serves to indicate the extent of mis-alignment and the extent of movement necessary to bring the image in proper registry on the paper. Whereas the scale 13 is attached to the bar 14 by means of a screw at one end thereof, it extends freely at the other end thereof as shown in Figure 7. This adjustment serves to compensate for the eccentricity L described above.

In Figure 5 may be seen the feed of the paper into printing engagement with the transfer roll 8 in which the center-line of the paper and the center-line of the image on the positive roll 8 are not coincident. Whereas most commercial feeders are provided with a side guide 43, none of these feeders provides a scale for measuring the movement of this guide in order to overcome any lateral eccentricities of the image on the printing plate. The rectilinear scale 44 in accordance with the present invention is fixedly mounted upon the feeder table frame 15 and serves to gage the amount of adjustment which must be imparted to the side guide 43 in order to bring the center-line of the image into coincidence with the center-line of the paper irrespective of the relation of the former with respect to the plate 20 or the positive transfer cylinder 8, (Figure 5). By providing the scale 44 which is finely graduated, the first printed sheet of paper run through the machine determines the amount of adjustment which must be

made upon the lateral guide 43 in order to bring the printed matter in the desired registry on the paper in a transverse direction.

While I have described my invention as embodied in specific form and as operating in a specific manner for purposes of illustration, it should be understood that I do not limit my invention thereto, since various modifications will suggest themselves to those skilled in the art without departing from the spirit of my invention, the scope of which is set forth in the annexed claims.

What I claim is:

1. In an apparatus of the class described, a printing cylinder having an image plate disposed upon the periphery thereof and extending over substantially the complete axial dimension of said cylinder, a feeding cylinder for sheets of paper to receive the impression of the image, a transfer cylinder between said printing cylinder and said feeding cylinder, gear wheels on said cylinders meshing with each other and maintaining driving engagement therebetween, means for adjusting the angular position of the printing cylinder relative to the gear wheel attached thereto, a frame having opposed walls for supporting said cylinders, a bar mounted on said frame and extending between said opposed walls slightly above said printing cylinder, and an arcuate scale member having one end thereof attached to said bar and extending for a short length above and around a portion of the periphery of the printing cylinder and mounted independently thereof for aligning the impression of the image upon the sheets of paper in a longitudinal direction.

2. In a printing apparatus of the class described, a frame, an adjustable rotary printing cylinder adapted to have an image plate covering substantially the complete axial dimension of said cylinder, a bar fixedly mounted in said frame slightly above said printing cylinder, and an arcuate thin leaf scale member having one end thereof attached near one end of said bar and extending for a short length above the printing cylinder with a curvature conforming substantially to that of the cylinder and the other end of said scale member being unsupported and extending freely, whereby the peripheral adjustment of the image plate on the printing cylinder may be gauged without the provision of circular scales directly upon said cylinder.

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