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PRINTING PLATE MOUNTING MEANS

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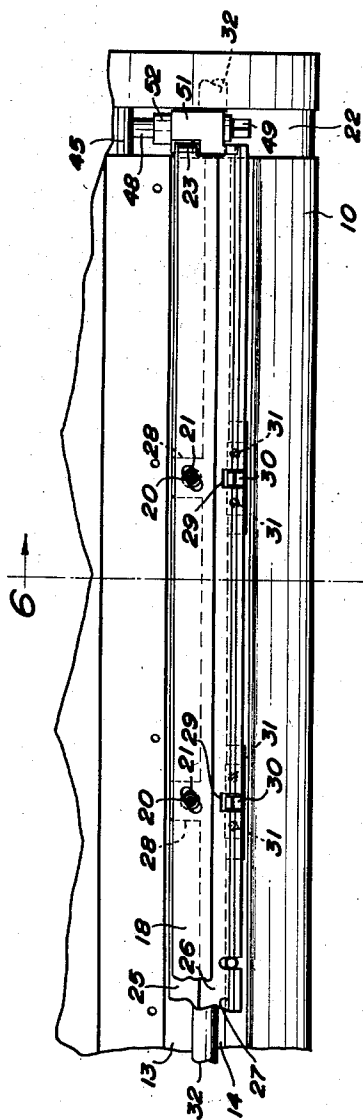


FIG. 5

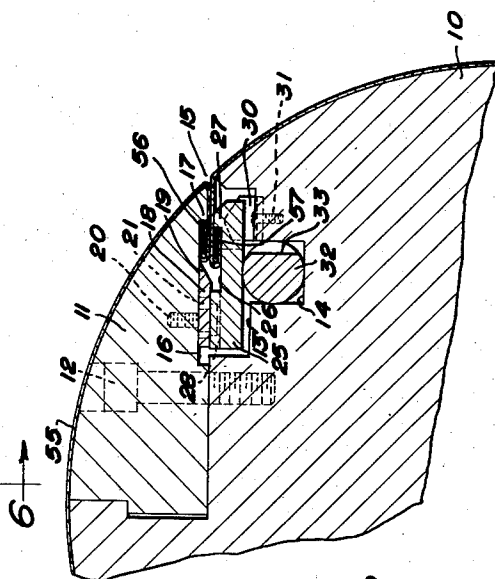


FIG. 6

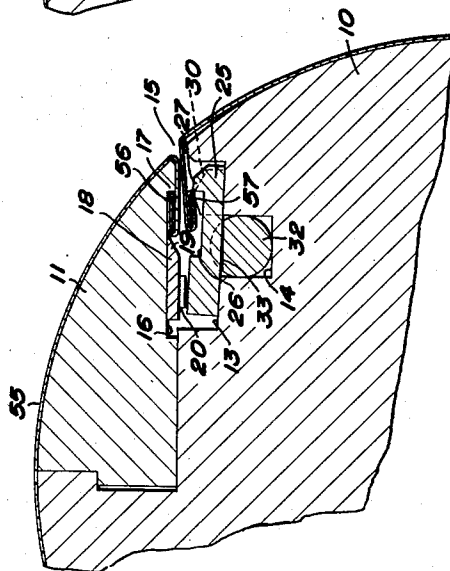


FIG. 7

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PRINTING PLATE MOUNTING MEANS

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This invention relates to improvements in printing plate mounting means, more specifically mounting means for flexible planographic printing plates. The invention has to do primarily with means for mounting planographic printing plates on plate cylinders of web presses in such manner that the gap of the cylinder may be extremely narrow, leaving nearly all of the cylinder circumference available for supporting the plate, and making possible the use of a cylinder of minimum diameter for printing a given length image.

One of the objects of the invention therefore is the provision of mounting means of such character as to be capable of use in a plate cylinder with an extremely narrow gap.

Another object of the invention is the provision of thin abutments on the plate ends for ready insertion through the narrow gap of the cylinder and yet capable of accurately positioning the plate on the exposing frame while the photographic image is being applied thereto, the same abutment being used later in positioning the plate on the plate cylinder of a printing press. By this means longitudinal registration of the different color plates during formation of the photographic images thereon and during printing is readily accomplished.

Another object is the provision in a plate cylinder of simple tensioning and plate lockup devices for a printing plate having the aforementioned abutments.

Another object is the provision of simple means for disengaging the abutments at the ends of the plate from the securing means in the cylinder preparatory to the removal of the plate.

Other objects and features of novelty will appear as we proceed with the description of that embodiment of the invention which, for the purposes of the present application, we have illustrated in the accompanying drawings, in which

Fig. 1 is an elevational view of the plate cylinder of a printing press equipped with means for mounting the plate in accordance with the invention;

Fig. 2 is a fragmental elevational view on a larger scale of one end of the cylinder of Fig. 1;

Fig. 3 is a fragmental end view of the cylinder taken partly in section on the line 3—3 of Fig. 2;

Fig. 4 is a fragmental sectional view taken substantially on the line 4—4 of Fig. 2;

Fig. 5 is a fragmental elevational view of the cylinder with a separable segment thereof removed;

Fig. 6 is an enlarged fragmental cross-sectional view taken substantially on the line 6—6 of Fig. 5 showing the plate locked up and tensioned;

Fig. 7 is a detail view corresponding to Fig. 6 showing the lock-up means relieved and the rear end of the plate disengaged;

Fig. 8 is an edge view of a preferred form of the printing plate according to the invention; and

Fig. 9 is a detail perspective view of a bracket employed in connection with the invention.

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A plate cylinder embodying the invention is illustrated in plan in Figs. 1 and 5, 10 being the cylinder proper and 11 being a removable segment which is locked in place by suitable means, as for example by a plurality of studs 12 set down within countersunk holes in the segment and threaded into the body portion 10 of the cylinder. The holes above studs 12 may be filled with lead flush with the surface of the cylinder 10. The segment 11 is removed from Fig. 5 in order to more clearly illustrate the internal construction.

In the body of the cylinder 10 there is formed a transverse cavity 13 having a lower extension or pocket 14. The cavity 13 merges with a narrow gap 15. In segment 11 there is a shallow undercut 16 which communicates with and in effect forms part of the internal cavity of the cylinder. The undercut 16 terminates slightly behind the outer surface of the cylinder to form a ledge 17.

In the undercut 16 there is mounted an elongated transverse plate 18 with a bevelled outer edge 19. This plate is supported upon headed screws 20 which extend through diagonal slots 21 in plate 18. The ends of plate 18 extend beyond the cylindrical surface of the cylinder 10 into pockets 22, and at these ends it carries upstanding lips 23 which may be engaged by a screwdriver or similar tool for forcing the plate endwise. Because of the screws 20 and diagonal slots 21 movement of the plate endwise toward the left, as viewed in Fig. 5, causes the plate to move outward toward the gap 15 for a purpose which will presently appear.

Within the cavity 13 there is a transverse metal bar 25 which is long enough to extend beyond the cavity at both ends and into the pockets 22. This bar has a shallow recess 26 that is terminated by a ledge 27. On its upper side, as viewed in Fig. 6, this bar is provided with cutouts 28 to accommodate the heads of screws 20. The forward edge of the bar has cutouts 29 occurring at spaced intervals to accommodate projections 30 that are secured to the body of the cylinder 10 by screws 31 or the like.

Cam means is provided for raising bar 25. Conveniently, this means may consist of a shaft 32 mounted in pocket 14 and having a flat 33 on one side. When shaft 32 is in the position of Fig. 6, bar 25 is forced upwardly into the position of that figure. When the shaft is turned to the position of Fig. 7 the flat 33 is uppermost and the bar 25 is permitted to descend. Shaft 32 extends through the cylinder and outwardly beyond each end wall thereof, where it carries a split yoke 35 that may be drawn into tight engagement with the shaft by a screw 36. Opposite the screw 36 yoke 35 is extended to form a stop 37 which is adapted to contact one or the other of two pins 38 and 39 which limit the swing of the shaft in either direction. By this means an operator can readily tell whether the cam shaft is in the position of Fig. 6 or in that of Fig. 7. Near the extremity of the shaft there are two drilled holes 40 for the reception of a pin by means of which the shaft may be turned. As indicated in Fig. 1 each end of the shaft is equipped with a yoke 35, thereby holding the shaft against endwise movement, and with a pair of holes 40 enabling the shaft to be operated from either end.

The bar 25 projects at each end into one of the pockets 22. Each of its ends is cut away centrally to form bifurcations 41 and 42. 43 are trunnions that are oscillatably mounted in bearings 44 in the ends of the cylinder. Each of these trunnions extends into one of the pockets 22 where there is keyed to it a yoke 45. A setscrew 46 holds the trunnion against endwise movement.

Each trunnion is drilled and tapped to receive the threaded end of a screw 48 having a squared opposite end

49 for the reception of a socket wrench. Screw 48 is formed with a shoulder 50 against which is seated a bracket 51 which is bored to loosely receive the smooth shank of the screw. A collar 52 is secured to the screw on the opposite side of the bracket. A lateral extension 53 on the bracket projects downwardly into the cutout of bar 25 between the bifurcations 41 and 42. A spiral spring 54 seated in recesses in the body of the cylinder and in a projecting part of yoke 45 serves to bias screw 48 and bracket 51 toward shaft 32. Bracket 51 has formed integrally therewith a projection 58 which engages bifurcation 42 to urge the bar 25 downwardly when the flat 33 of shaft 32 faces the bar.

The flexible planographic plate 55 to be mounted on the cylinder is illustrated in edge view in Fig. 8. Preferably it is thin sheet metal and of a length sufficient to encircle the cylinder, to extend through the gap 15 and to be fastened in the cavity 13. We provide transverse reinforcing abutments at the extremities of the plate, as these are required for cooperation with the lockup and tensioning means which we have designed. However, it is a purpose of the invention to utilize a gap 15 of the least width possible. Consequently we provide these abutments by folding over the metal of the plate to form reinforcements consisting of several thicknesses of metal, the folds being accurately made at right angles to the side edges of the plate. These abutments, numbered 56 and 57, have little thickness, comparatively speaking, and can be projected one at a time through the gap 15.

When a plate is to be attached to the cylinder the bar 25 is lowered to the position of Fig. 7. The abutment 56 is then pushed through the gap 15 and over the ledge 27. Bar 25 is then raised by the rotation of cam shaft 32 to force the abutment into position behind ledge 17. The plate may then be wrapped around the cylinder. Next the cam shaft 32 is turned to bring flat 33 into position to permit bar 25 to be retracted by springs 54. Then the opposite end of the plate with its abutment 57 is pushed through the gap 15 and inwardly beneath the first mentioned end behind ledge 27. Shaft 32 is then turned to push bar 25 toward sector 11 and to force the two ends of the plate outwardly of their abutments into close engagement with each other and to hold the abutments 56 and 57 in position behind the shoulders on ledges 17 and 27. Now the two screws 48 may be turned individually to draw the ends of the bar 25 inwardly away from the surface of the cylinder and thus tension the plate and bring it into tight contact with the cylinder at all points.

When a job of printing has been completed the plate must of course be removed. We have found that this may be extremely difficult in some cases unless special means for stripping the abutments 56 and 57 from their ledges 17 and 27 are provided. In accordance with our invention the plate may be quickly removed as follows. First the screws 48 are backed away to relieve the tension on the plate. Then the cam shaft 32 is turned to the position of Fig. 7. This should permit the springs 54 to swing the bar 25 down to the bottom of its recess 13. If necessary the operator can assist the springs by pushing down the brackets 51. As the bar 25 moves in this direction the cutouts 29 pass the projections 30 and the latter are engaged by the abutment 57 which is thus forced out of the recess 26 behind ledge 27. This end of the plate may then be withdrawn through the gap 15. The plate is then unwrapped. Next the operator forces the lip 23 on the right hand end of plate 18 toward the left, and this functions through the pins 20 and diagonal slots 21 to shift the bevelled edge of the plate 18 to the right as viewed in Fig. 6, thereby stripping the abutment away from the ledge 17, when that end of the plate also may be readily withdrawn through the gap.

In addition to providing an excellent means for securing the plate to the cylinder while utilizing a very narrow

gap, the invention employs the abutment 56 on the forward end of the plate as a positioning and registering means during the formation of a photographic image on the plate, that is by accurately locating the plate on the photographic exposing frame, and employs the same abutment for accurately positioning the plate on the printing cylinder.

Having thus described our invention, we claim:

1. In combination with a plate cylinder of a printing press having a narrow gap in its periphery, a sheet plate carrying a printing image on its outer surface, said cylinder having a transverse cavity communicating with said gap, both ends of said plate extending face to face through said gap into said cavity, transverse abutments on the back surface of the plate at the ends thereof, means comprising a pair of ledges over which the plate ends extend, one of said ledges within the cavity presenting a shoulder against which one of said abutments engages, means within the cavity for engaging and snugly holding together the facing surfaces of the plate opposite their abutments and thereby maintaining said first named abutment against said shoulder, means for moving the other of said abutments inwardly away from the cylinder surface while maintaining said facing surfaces of the plate in contact, said means for moving the other of said abutments inwardly away from the cylinder surface comprising means for moving said other abutment toward the first named abutment.

2. A plate cylinder substantially as defined in claim 1, wherein one of said ledges is fixed in the cylinder, and wherein said holding means comprises means for moving the other of said ledges toward and away from the fixed ledge, both the means for moving the latter ledge toward the fixed ledge and for forcing the movable ledge inwardly away from the cylinder surface being operable from an end of the cylinder.

3. In a plate cylinder having a transverse internal cavity and a narrow gap at the surface communicating with said cavity, a sheet plate, reinforcements at the ends of said plate comprising transverse abutments on the back of the plate, a fixed transverse ledge within said cavity over which the plate extends presenting a shoulder against which one abutment bears, a bar disposed within the cavity carrying a ledge over which the other end of the plate extends and presenting a shoulder against which the other abutment bears, the ledge surfaces over which the plate extends facing each other, cam means operable from an end of the cylinder for forcing said bar toward said fixed ledge and the ledge engaged portions of the plate into contact with each other, whereby both of said abutments are held in contact with their ledges, and means operable at an end of the cylinder for forcing said bar inwardly away from the gap.

4. In apparatus substantially as defined in claim 3, means for stripping from said fixed ledge the abutment engaged therewith, said means comprising a transverse plate having a bevelled edge adjacent said abutment, and means operable from an end of the cylinder for advancing said bevelled plate toward said abutment and wedging it away from said ledge.

5. Apparatus substantially as defined in claim 3, wherein said means for forcing the bar inwardly away from the gap comprises at each end of the cylinder an oscillatable trunnion and a screw threaded therein, a bracket adapted to be advanced by the screw, and a loose connection between each bracket and the bar adapted to compensate for relative angular movement and permit the said movement of the bar toward or away from the fixed ledge.

6. In apparatus substantially as defined in claim 5, spring means acting upon each of said screws biasing said bar away from said fixed ledge, and fixed projections in said cavity adapted to engage said second named abutment when said cam means is withdrawn and said spring means swings said screws in a direction to move

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said bar away from said fixed ledge, whereby the second named abutment is stripped from the second named ledge.

7. In combination with a printing press plate cylinder having a narrow gap in its periphery, a sheet plate carrying a printing image on its outer surface, said cylinder having an inwardly extending transverse cavity disposed along a chordal plane through the cylinder and communicating with said gap, both ends of said plate loosely extending face to face through said gap into said cavity, one of the plate ends forming an acute angle with the surface of the cylinder and the other forming an obtuse angle therewith, manually operable means within the cavity and wholly below the peripheral surface of the cylinder for first moving one face laterally toward and against the other and thereby snugly engaging and holding the facing surfaces of the plate ends together, and manually operable means for subsequently moving the plate end which encloses the obtuse angle inwardly away from the cylinder surface to tension the plate on the cylinder while maintaining the previously engaged facing surfaces in contact.

8. The combination according to claim 7 wherein the means for engaging the facing surfaces acts directly on that end of the plate which is moved inwardly to tension the plate.

9. The combination according to claim 8 wherein a transverse abutment is provided on the back surface of that end of the plate which is moved inwardly and wherein the said moving means comprises a shoulder which coacts with the abutment to draw the plate end inwardly.

10. The combination with a printing press plate cylinder having a narrow gap in its periphery, a sheet plate carrying a printing image on its outer surface, said cylinder having an inwardly extending transverse cavity communicating with said gap, both ends of said plate extending face to face through said gap into said cavity, means within the cavity for snugly engaging and holding the facing surfaces of the plate together, means for anchoring one plate end in the cavity and moving the second plate end inwardly away from the cylinder surface to tension the plate on the cylinder while maintaining said facing surfaces in contact, the means for moving the second end inwardly comprising an abutment on that end and a shoulder for engaging said abutment which, when moved

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inwardly, co-acts with the abutment to draw the plate inwardly, said shoulder comprising a portion of a floating transverse bar, the means for engaging the facing surfaces comprises a round oscillatable shaft on a fixed axis adjacent and generally parallel to the bar, said shaft having a flat surface therealong which, when the flat is adjacent the bar, permits lateral floating of the bar, and which, when turned on its axis to present a rounded surface against the bar, presses the bar and thus the facing surfaces into snug engagement.

11. The combination according to claim 10 wherein the moving means includes individually operable means coacting with the ends of the bar to move it inwardly to tension the plate on the cylinder.

12. The method of mounting a flexible sheet metal plate on a printing press plate cylinder having a narrow transverse gap and a narrow inwardly extending cavity communicating with the gap, comprising the steps of inserting one end of the plate into the cavity, wrapping the plate around the cylinder, inserting the other end of the plate into the cavity so that the surfaces near the ends are closely adjacent and facing each other, moving the second end face laterally toward and against the first end face to press the facing surfaces into snug engagement with each other, and drawing said second end inwardly of the cylinder to tension the plate while maintaining the facing surfaces of the plate in contact.

References Cited in the file of this patent

UNITED STATES PATENTS

873,398	Wattles	Dec. 10, 1907
982,774	Bagalio	Jan. 24, 1911
1,220,668	Meisel	Mar. 27, 1917
1,374,859	Marquardt	Apr. 12, 1921
1,774,777	Wood	Sept. 2, 1930
1,827,300	Pritchard et al.	Oct. 13, 1931
2,047,364	Foster	July 14, 1936
2,055,295	Kessler	Sept. 22, 1936
2,101,052	Davis	Dec. 7, 1937
2,639,668	Chase et al.	May 26, 1953
2,778,307	Heller	Jan. 22, 1957

FOREIGN PATENTS

556,325	Germany	Aug. 6, 1932
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