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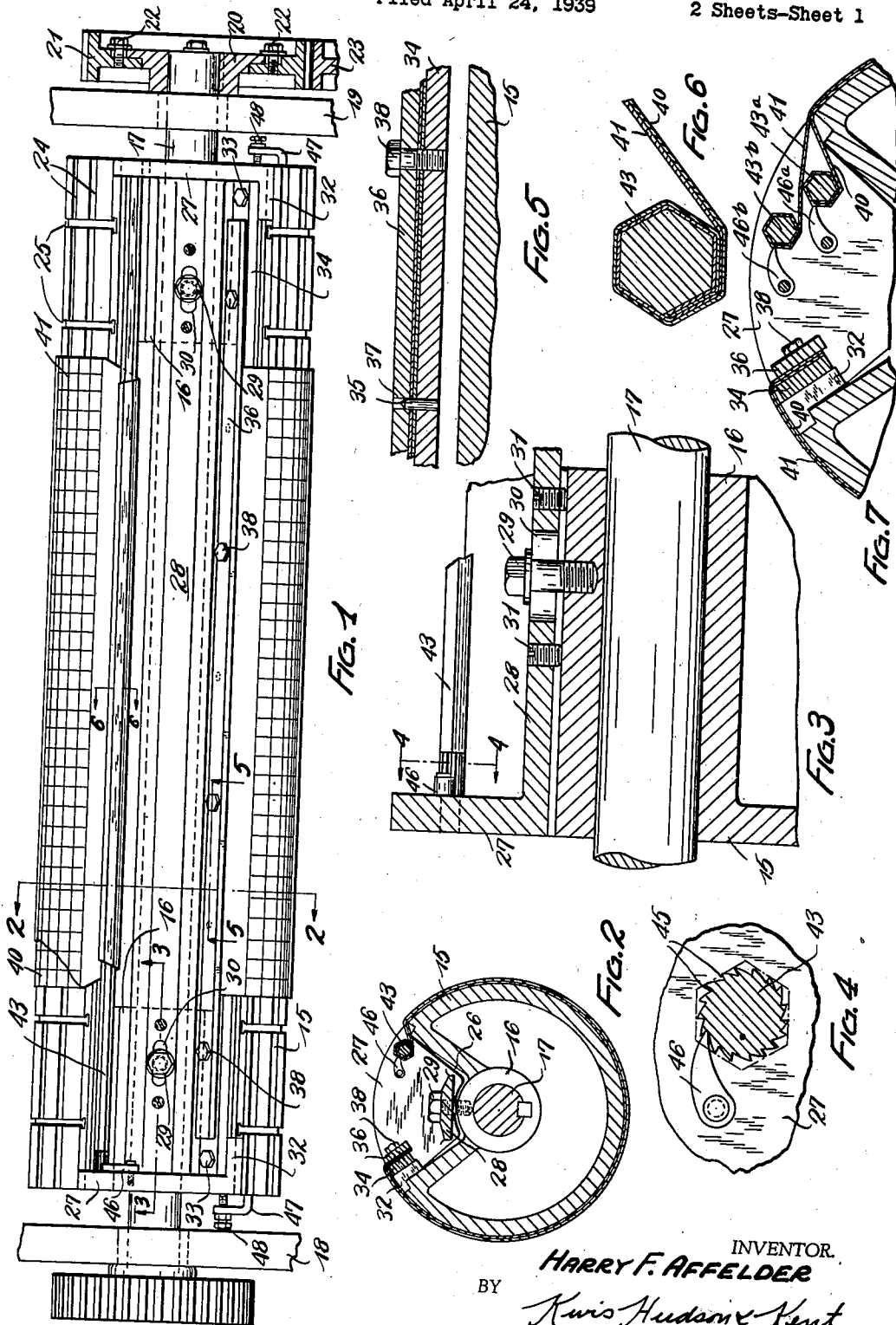
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2,294,879

PLATE MOUNTING

Filed April 24, 1939

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

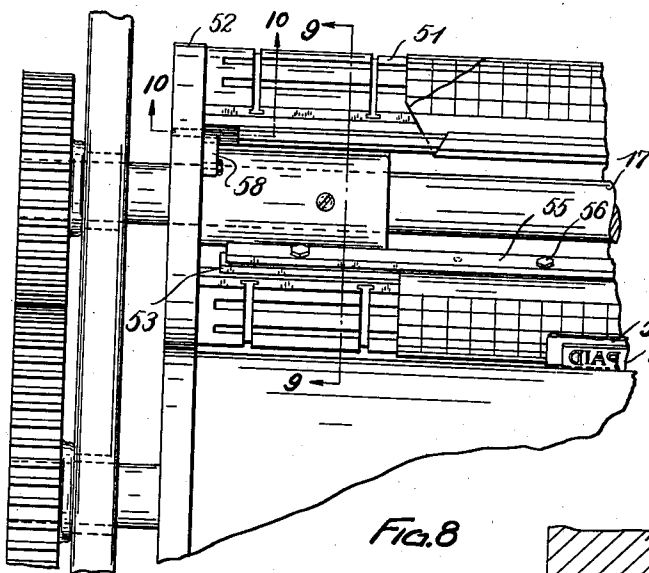


Fig. 8

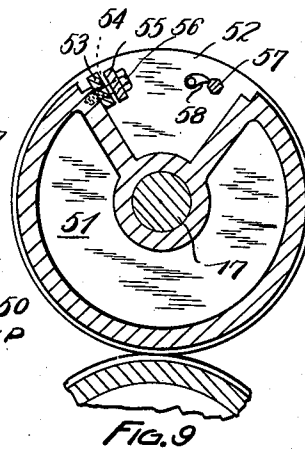


Fig. 9

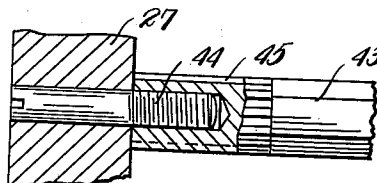


Fig. 10

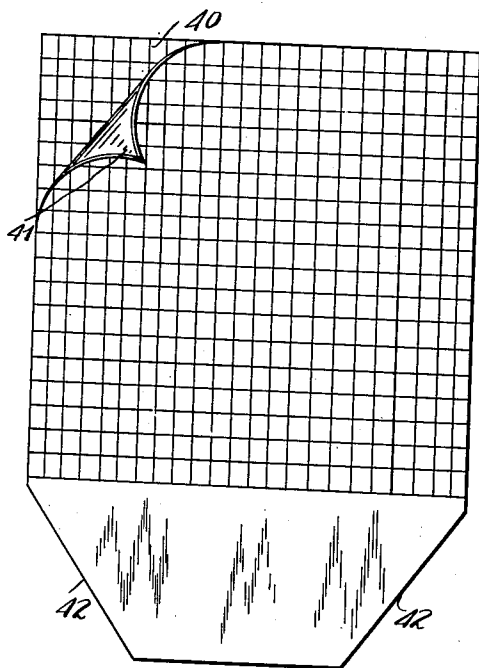


Fig. 11

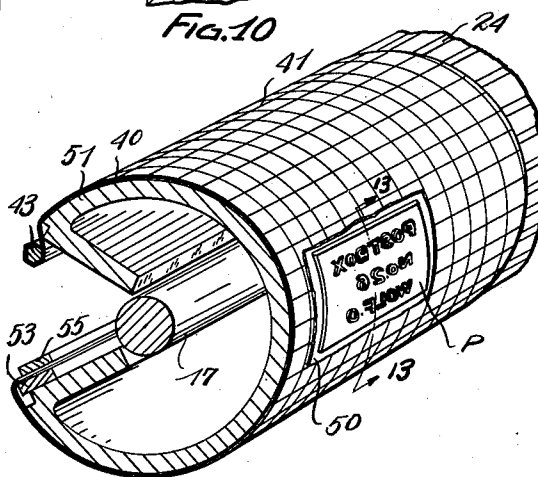


Fig. 12

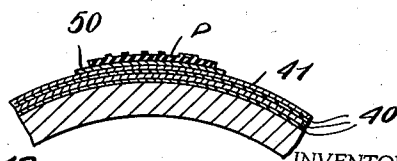


Fig. 13

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PLATE MOUNTING

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10 Claims. (Cl. 101—415.1)

This invention relates to improvements in plate mountings, that is to say means for quickly and effectively mounting printing plates upon a printing cylinder particularly, and especially mounting means of this character which shall permit of readily using make ready where necessary. In printing from molded rubber printing plates as heretofore practiced, for example, it has been customary to mount the rubber plate upon a heavy steel arcuate saddle curved to correspond with the curvature of the cylinder, this saddle being secured to the cylinder by clamps. A procedure of this kind is subject to certain disadvantages. In the first place the arcuate saddle must be accurately shaped and must be handled with care to prevent its being deflected so as to depart from its original curvature. Secondly, it is difficult to maintain the combined thickness of arcuate saddle and rubber plate to accurate measurement, and the use of make ready with such a saddle is difficult and laborious. Thirdly, such saddles cover small portions only of a cylinder and must be moved to different portions of the cylinder in order to meet the requirements of different printing jobs.

One of the objects of the present invention is to provide a mounting for printing plates which shall permit one or more of the plates to be secured to the cylinder in any position of the latter without change of the mounting means.

Another object is the provision of a mounting means which shall be of such character that it may readily be caused to conform to the contour of the support, and will at the same time permit the introduction of make ready quickly and effectively either under certain portions only or under all of the printing plate.

A further object is the provision of a mounting in which is used non-metallic sheet material with a smooth surface capable of having adherent material stripped therefrom without damaging the surface.

Still another object is the provision of a mounting of this character in which the mounting sheet shall be transparent and in which an underlay sheet constituting the outermost sheet of the packing shall have gauge marks thereupon visible through the mounting sheet for the guidance of the pressman in positioning the printing plate.

Another object is the provision of a flexible sheet mounting of this kind wherein the sheet may be loosened and moved with respect to the cylinder so as to permit fine adjustments of the

plate such as are necessary in multi-color work in order to effect accurate registration.

Other objects and features of novelty will appear as I proceed with the description of those embodiments of the invention which, for the purposes of the present application, I have illustrated in the accompanying drawings, in which—
Fig. 1 is a view principally in elevation illustrating my invention as applied to the plate cylinder of a printing press.

Fig. 2 is a cross sectional view taken substantially on the line 2—2 of Fig. 1.

Fig. 3 is a fragmental longitudinal sectional view taken substantially on the line 3—3 of Fig. 1.

Fig. 4 is a detail sectional view illustrating a ratchet lock for a rotatable tensioning bar used in connection with the invention.

Fig. 5 is a fragmental longitudinal view of sheet gripping means, the view being taken on the line 5—5 of Fig. 1.

Fig. 6 is a detail sectional view of one of the rotatable tensioning bars.

Fig. 7 is a fragmental sectional view on a somewhat larger scale illustrating the securing and tensioning means for the packing and top or draw sheets with provision for tightening the top sheet independently of the packing sheet or sheets.

Fig. 8 is a fragmental elevational view of a modified form of the invention.

Fig. 9 is a transverse sectional view of the same taken on the line 9—9 of Fig. 8.

Fig. 10 is a fragmental view partly in section on the line 10—10 of Fig. 8, showing journalling means for one of the tensioning bars.

Fig. 11 is a plan view of packing and top sheets.

Fig. 12 is a fragmental perspective view of the cylinder with packing and top sheets mounted thereupon.

Fig. 13 is a fragmental sectional view taken substantially on the line 13—13 of Fig. 12.

Referring first to Figs. 1 to 7 inclusive of the drawings, which illustrate the preferred form of the invention, 15 represents a cylinder having at its ends internally extending hubs 16 which are keyed to a shaft 17, the latter extending through and having bearing in frame members 18 and 19 of a printing press. On one end of shaft 17 there is keyed a gear hub 20 which carries a gear 21 of ring form that is adjustable angularly upon hub 20 by means of clamping screws or bolts 22. Gear 21 meshes with a gear 23 by means of which it is driven. Hence, by loosening the clamping screws 22 the operator

may turn shaft 17 to angularly adjust the cylinder and vary the timing thereof with respect to the other moving parts of the machine.

As herein shown the surface of the cylinder is provided with longitudinal and circular grooves 24 and 25 of T-shape cross section for the reception of clamps such as have been used heretofore for mounting heavy arcuate saddles in various positions upon the cylinder. It will be understood, however, that these grooves are not utilized in the present invention and that a smooth cylinder without grooves would function equally as well in so far as the present invention is concerned.

The cylinder 15 is formed with a segmental cavity 26 which extends throughout its length, this cavity being utilized normally in machines of this character to receive a turtle that is adapted to carry type, linotype, electrotypes or the like. In the use of the press with my invention however this cavity has mounted therein an assembly of a new type which includes a frame that is preferably an integral casting and consists of two sector shaped end plates 27 and a longitudinal connecting bar 28. This frame is rigidly although adjustably mounted on the cylinder by means of cap screws 29 which extend through slots 30 in the bar 28 and are threaded into tapped holes in the cylinder hubs 16. As a convenient and economical means for properly positioning the frame in parallelism with the shaft 17 I mount set screws 31 in threaded openings in bar 28 on opposite sides of each screw 29, these set screws bearing against the surfaces of the hubs 16. The screws 29 are of course loosened before adjustment of the screws 31 is undertaken.

The plates 27 at their outer corners fit snugly within segmental cavities 26 so as to cooperate with the screws 29 for preventing any angular movement of the frame. Plates 27 also include integral lugs 32 that extend a short distance inwardly from the plates. These lugs are drilled and tapped to receive screws 33 by means of which a longitudinal bar 34 is mounted on the frame. At intervals throughout the length of this bar there are pointed pins 35 which project a short distance above the surface of the bar. A second bar 36 having holes 37 to register with the pins 35 is adapted to be clamped to bar 34 by screws 38 which project through smooth holes in bar 36 into threaded holes in bar 34. The bars 34 and 36 serve as clamping strips for one or more flexible sheets which are fitted over the pins 35 and punctured thereby, the screws 38 extending through the sheets which preferably, although not necessarily, are previously perforated to receive the screws. As illustrated in Figs. 5 and 7 there is a single packing sheet 40 and a top sheet 41, but as a rule a plurality of packing sheets are employed in order that the cylinder may be built up to the desired radius beneath the printing plate.

The sheets 40, 41, after being secured at one end between the clamping bars 34 and 36, are wound around the cylinder and their opposite ends, which are preferably cut with a taper or bevel as shown at 42 in Fig. 11, are wrapped around a rotatable bar 43 mounted in the frame and positioned beneath the outer surface of the cylinder. Bar 43 is preferably hexagonal. It is journaled by suitable means in the end plates 27 of the frame. One satisfactory journaling means is illustrated in Fig. 10, which shows the bar 43 cut to a length to fit between the plates

27, drilled axially and tapped to receive screws 44 that are smooth on their outer ends so as to form trunnions which are rotatable in smooth bores formed in the end plates 27. One end of the bar has ratchet teeth 45 cut therein and a pawl 46 is pivoted to the corresponding plate 27 to take into the notches formed by the teeth 46 so as to lock the bar in adjusted position. The bar 43 may be rotated by applying a wrench to one end of the hex beyond the sheets, and the rotation may be continued until the sheets are tightened to the desired tension. When it becomes necessary to relieve the tension or to remove one or more sheets, the pawl 46 is pried up out of engagement with the ratchet teeth 45, when the bar may be freely turned in a direction to unwind the sheets.

I provide suitable means for moving the frame 27, 28 longitudinally to a small extent, which means may consist for example of brackets 47 carried by the cylinder and extending endwise therefrom, these brackets carrying adjusting screws 48 which bear against the outer surfaces of end plates 27. When this adjustment is to be utilized the screws 29 are loosened and the tension on the sheets 40, 41 is relieved by the means previously explained, after which one of the screws 48 is loosened and the other screw tightened to effect the desired longitudinal movement. This adjustment and the adjustment of the cylinder angularly by means of the screws 22, while convenient, are not essential for ordinary single color work, as the printing plate may be removed and repositioned by hand accurately enough for such cases, but where the invention is applied to two-color work the longitudinal and angular adjustment of the mounting sheets, as by the means herein disclosed, is essential in order to obtain accurate registration.

In some cases I prefer to have the mounting and tensioning of the top sheet 41 effected independently of the mounting and tensioning of the packing sheets, and for this purpose the arrangement disclosed in Fig. 7 is suitable. It involves the use of two separate rotatable bars 43a and 43b corresponding in form and function to the bar 43, the packing sheets being wound upon bar 43a and the top sheet or draw sheet upon bar 43b. Pawls 46a and 46b lock the bars in adjusted position in the same manner as does the pawl 46 with respect to bar 43.

For the packing any suitable sheet material may be used. The top sheet 41 may be paper, cardboard, thin sheet metal or fabric, but I prefer to utilize a transparent or translucent sheet which may advantageously have a smooth, hard surface. Such a sheet is relatively inexpensive and flexible enough to conform perfectly with the contour of the cylinder or that of the packing sheets, and if possessed of a smooth hard surface permits the application and removal of rubber plates or other printing plates numerous times without damage to the sheet. The outer one of the packing sheets 40 may be scribed as indicated particularly in Fig. 11 to form gauge marks that are visible through the transparent top sheet and afford guides for the pressman in locating the printing plate or plates. These scribed lines may be numbered or made of different colors or otherwise individualized for the convenience of the operator.

A rubber plate is illustrated at P in the drawings. Such plates are molded by means well known in the art. They are secured to the top sheet 41 by adherent material, which most con-

veniently is a piece of fabric known in the art as sticky back, which has adhesive on both sides, and although it provides a firm grip, nevertheless may be stripped from a hard surfaced sheet material without damaging the latter in any way. Such adherent material is indicated in the drawings at 50. However, the plate may be secured to the sheet 41 by ordinary adhesives if desired.

The form of the invention illustrated in Figs. 8, 9 and 12 is quite similar to that previously described, but in this case the plate cylinder 51 has continuous circular end plates 52, known in the art as bearers, and there is no separate frame mounted within the segmental cavity of the cylinder. In this case a clamp bar 53 similar to bar 34 is attached to the cylinder, as by screws 54, and this bar may be provided with pointed pins like the pins 35 of bar 34, and may be normally covered by an upper clamping bar 55 which is secured to the bar 53 by screws 56 or the like. On the other side of the segmental cavity there is a tensioning bar 57, similar to the bar 43, rotatably mounted in the bearers 52 of the cylinder and around which the flexible sheets are wrapped in the same manner as in the first form of the invention. The bar 57 is also locked in adjusted position by means of a pawl 58 like the pawl 46 previously described.

Printing procedure by means of the apparatus herein described will be readily apparent to those skilled in the art. When one printing job is finished and another is about to be run it is generally necessary for the operator merely to strip off the sticky back 50 with the plate 52 thereon, and to take a new rubber plate previously prepared for the purpose and stick it to the sheet 41 at the proper position of the cylinder to bring the imprint into the desired position on the paper sheet. If when a test sheet is run through the press the printing is not quite in the desired position the operator strips off the plate and sticks it on again in a slightly different position and takes another impression, the scribed lines on the packing sheet 40 assisting greatly in this setting up of the job. Of course, if preferred, the effective position of the plate may be altered by adjusting the cylinder or mounting means as previously explained. Usually when a proper number of packing sheets have been assembled on the cylinder to give a satisfactory impression from a rubber plate, further plates can be applied and the press operated without any other change, because the apparatus available for molding rubber plates turns them out with uniformity as to thickness. If make ready should be necessary in a particular case, however, it is readily applied by loosening the top sheet 41 and inserting the make ready beneath it.

One important advantage of the invention is that a slotted cylinder such as is illustrated in the drawings, and which is not adapted of itself for printing from rubber plates, may be quickly converted to a condition for such printing and as quickly reconverted to its original condition. This facility adds greatly to the usefulness of a given machine.

It will be apparent therefore that setting up a press equipped with my improvements in order to perform a given printing job involves a minimum of time and effort, and that this facility in setting up the job contributes greatly to maintaining minimum printing costs.

While in the foregoing description I have

referred particularly to the mounting of rubber plates, it should be understood that the invention in its broader aspects applies to other pliable or flexible plate material, and in fact to any material of which printing plates may be made.

Having thus described my invention, I claim:

1. In apparatus of the class described, a support for a printing form, a flexible non-resilient sheet packing mounted upon said support, means for tensioning said packing to conform to the contour of the support, a flexible top sheet superposed upon said packing, means for gripping and tensioning said top sheet to conform to the surface of the packing comprising a roller engaging one end of the sheet, and a rubber printing plate removably secured to the top sheet, whereby make ready may be inserted beneath the top sheet without disturbing the packing.

2. In apparatus of the class described, a support for a printing form, a flexible sheet packing mounted upon said support, said sheet being scribed to provide gauge marks on its surface, a flexible transparent top sheet superposed upon said packing through which said gauge marks are visible, means for tensioning said top sheet to conform to the surface of said packing, and a printing plate removably secured to the top sheet in a selected position with respect to said gauge marks.

3. In a printing machine, a form cylinder having a segmental cavity extending longitudinally thereof, a removable frame mounted in said cavity, flexible sheet material overlying the surface of the cylinder angularly removed from said cavity, means carried by said frame for mounting and tensioning said sheet material, and a printing plate secured to the surface of said sheet material.

4. In a printing machine, a form cylinder having a form supporting portion interrupted by a segmental cavity extending longitudinally of the cylinder, a frame mounted in said cavity, flexible sheet material overlying the surface of the form supporting portion of the cylinder, means carried by said frame for mounting and tensioning said sheet material, a printing plate secured to the surface of said sheet material, and means for adjusting said frame longitudinally in the cylinder.

5. In a printing machine, a form cylinder having a segmental cavity extending longitudinally thereof, a frame mounted in said cavity, flexible sheet material overlying the surface of the cylinder on either side of said cavity, means carried by said frame for mounting and tensioning said sheet material, a printing plate secured to the surface of said sheet material, means for adjusting said frame longitudinally in the cylinder, driving means for said cylinder, and means for adjusting the cylinder angularly with respect to the driving means.

6. In a printing machine, a form cylinder having a form supporting portion interrupted by a segmental cavity extending longitudinally of the cylinder, a frame mounted in said segmental cavity, flexible sheet material attached to said frame overlying the surface of the form supporting portion of the cylinder tensioned to conform to the contour thereof, a printing plate, adherent material between said printing plate and the surface of said sheet material for securing the plate in position upon the cylinder, means for relieving the tension upon said sheet material, and means for adjusting said frame longitudinally in the cylinder while the tension upon said sheet material is thus relieved.

7. In a printing machine, a form cylinder having a segmental cavity extending longitudinally thereof, a flexible sheet packing surrounding said cylinder, a flexible non-resilient top sheet superposed upon said packing, means within the segmental cavity of the cylinder for gripping the ends of said packing and top sheet throughout the extent of said ends and for tensioning the same to conform to the contour of the cylinder, and a rubber printing plate secured to said top sheet by adherent material.

8. In a printing machine, a form cylinder having slots in the surface thereof running transversely and circumferentially for the reception of clamps by means of which metal forms may be removably attached to the cylinder, a flexible sheet removably mounted upon the cylinder covering certain of said slots, means for tensioning the sheet to cause the same to conform to the curvature of the cylinder, and a rubber printing plate secured to said sheet by adherent material.

9. In a printing machine, a form cylinder having slots in the surface thereof running transversely and circumferentially for the reception of

clamps by means of which metal forms may be removably attached to the cylinder, flexible packing in sheet form mounted upon the cylinder covering certain of said slots, a flexible non-metallic sheet superposed upon said packing, means for tensioning said packing and said superposed sheet to cause the same to conform to the curvature of the cylinder, and a rubber printing plate secured to said superposed sheet by adherent material.

10. In a printing machine, a form cylinder having a longitudinal segmental cavity therein, said cylinder being adapted to removably receive and hold in said cavity a turtle upon which a printing form may be mounted, a flexible sheet removably mounted upon the cylinder, a frame adapted to fit within said cavity when the turtle is removed, means carried by the frame for holding the ends of said sheet and tensioning the sheet to conform to the curvature of the cylinder, and a rubber printing plate secured to said sheet by adherent material.

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