Oct. 29, 1963 J. T. BARNES 3,108,538

FLEXIBLE-PRINTING-PLATE SECURING ARRANGEMENT

Filed Nov. 7, 1962 2 Sheets-Sheet 1

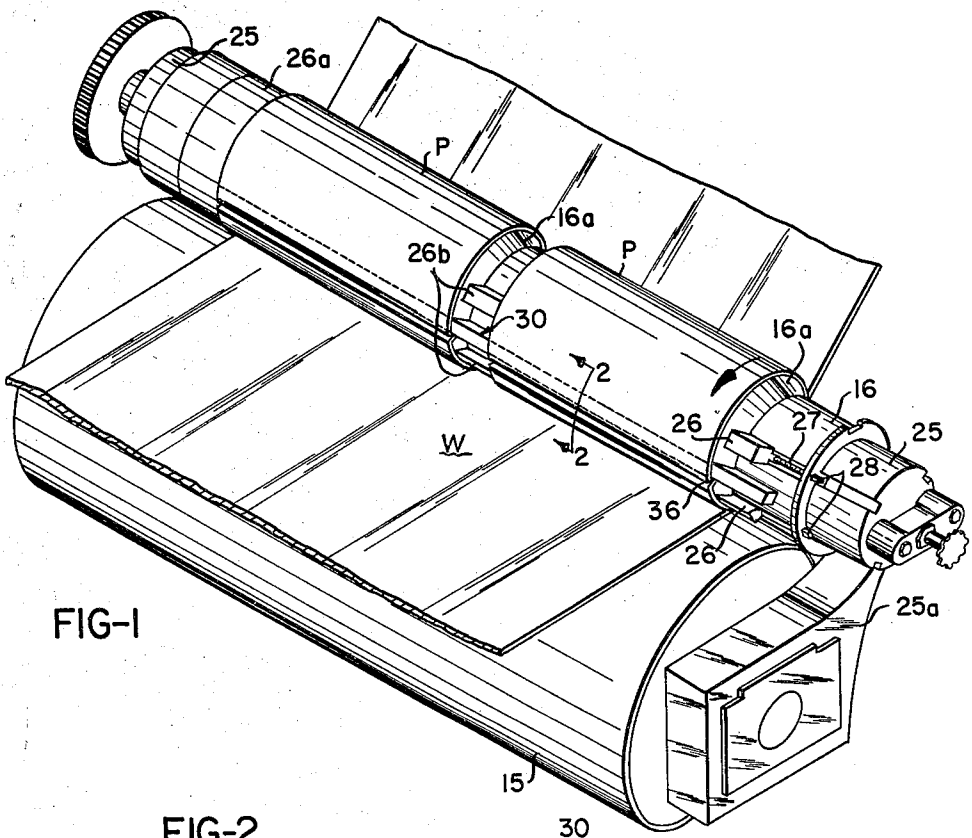


FIG-1

FIG-2

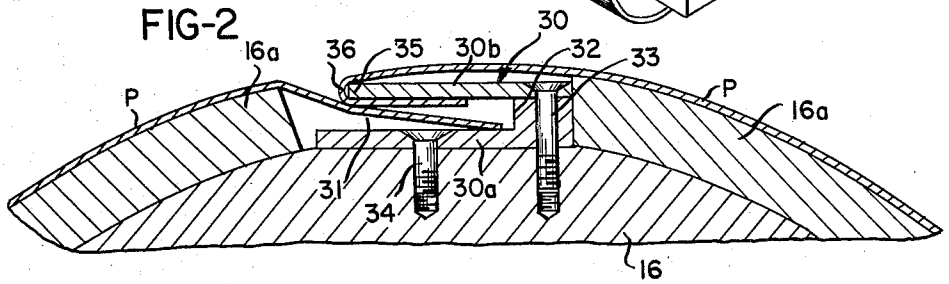


FIG-3

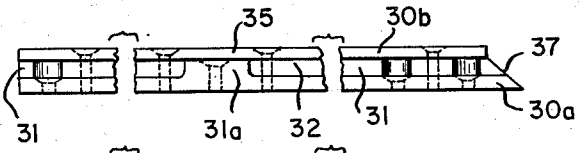
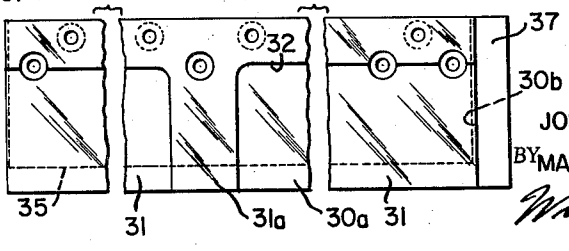


FIG-4



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FLEXIBLE-PRINTING-PLATE SECURING ARRANGEMENT

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FIG-5

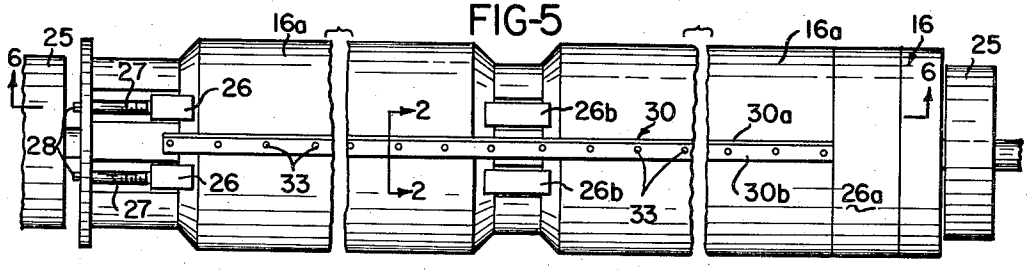
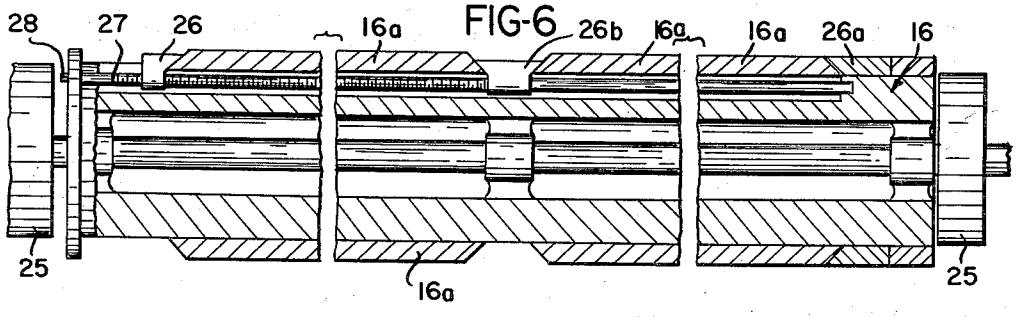


FIG-6



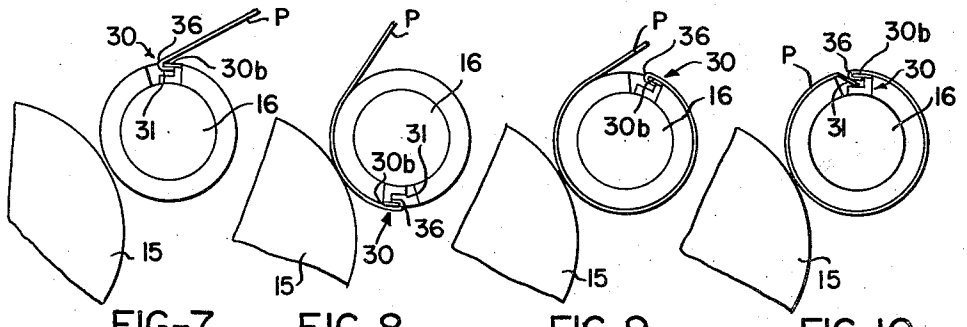


FIG-7 FIG-8 FIG-9 FIG-10

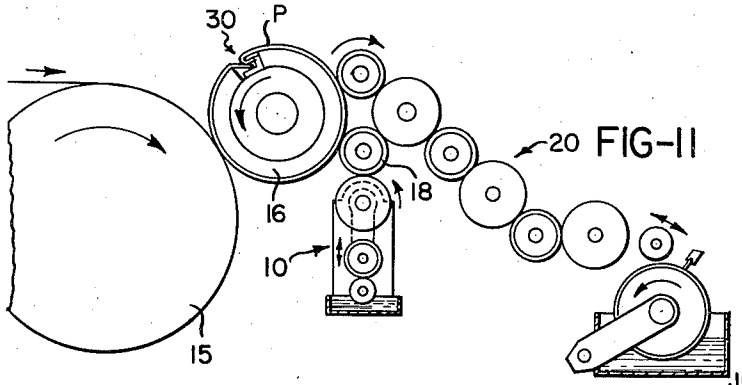


FIG-11

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3,108,538
FLEXIBLE-PRINTING-PLATE SECURING ARRANGEMENT

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2 Claims. (Cl. 101—415.1)

My invention relates to a flexible-printing-plate securing arrangement. It has to do, more particularly, with means for securing a flexible printing plate, such as a planographic plate, to a cylinder adapted to be rotated in the printing operation.

The invention may be applied to the plate cylinder of a printing press using an attachment of the type disclosed in my Patent No. 3,007,403 of November 7, 1961, although it is capable of application to many other plate cylinders. My invention is particularly applicable to a plate cylinder of the kind used in a letterpress and is such that it permits the mounting of the planograph plate on such cylinder. According to my invention, the printing plate is so applied to and secured to the cylinder that the forces created on the plate by the engagement of the impression cylinder therewith will tend to cause the plate to embrace the plate cylinder even more snugly.

For planographic printing, the printing plate sometimes comprises a relatively thin plate of sheet metal, such as aluminum, that is fastened to the surface of the plate cylinder. This invention is directed to a registration or attaching bar arrangement which may be attached to the usual letterpress-type plate cylinder to secure the planographic plate or similar plates thereto. This invention permits the press to be interchangeably set up for either letterpress operation or planographic operation in a minimum amount of time. With this arrangement, a letterpress-type plate which has been previously mounted on the cylinder may be removed and be replaced with a flexible planographic printing plate which is secured to the cylinder.

The accompanying drawings illustrate an embodiment of my invention and in these drawings:

FIGURE 1 is an isometric view showing a cylinder in a press having planographic printing plates mounted thereon according to my invention.

FIGURE 2 is an enlarged transverse sectional view taken at the location indicated at line 2—2 of FIGURE 1 and line 2—2 of FIGURE 5 showing the attaching or registration bar assembly cooperating with the planographic plates.

FIGURE 3 is an edge elevational view of the registration or attaching bar assembly.

FIGURE 4 is a plan view of the lower member of the bar assembly.

FIGURE 5 is an elevational view of the cylinder with the plates mounted thereon.

FIGURE 6 is an axial sectional view taken along line 6—6 of FIGURE 5.

FIGURES 7 to 10 are diagrammatic views in end elevation showing the plate cylinder and the successive steps in applying the planographic plates thereto.

FIGURE 11 is a diagrammatic view illustrating a printing press having a plate cylinder of a kind to which my invention may be applied.

With reference to the drawings, in FIGURE 11 I have illustrated a printing press having an attachment like that shown in my Patent No. 3,007,403 which is such that the press may be used as a letterpress or as a planographic press. In the drawing, I have shown a direct lithographic press where the paper W is fed in web form between an impression cylinder **15** and a plate cylinder **16**. The necessary inking and ink pick-up apparatus, as described in said patent, is indicated generally at **20** and supplies

ink to the cylinder **16**. For letterpress operation, the cylinder **16** will have a type plate mounted thereon which will have raised letters or type in relief form. At this time, the water pick-up or dampening apparatus, described in said patent and indicated generally at **10**, will be disengaged from the form roller **18**. When used as a lithographic press, the water pick-up or dampening apparatus **10** will be engaged with the roller **18**.

The plate cylinder **16** is constructed in the usual manner for a letterpress and is adapted to receive and retain the type plate, the one shown in the drawings being adapted to receive two plates axially aligned. When used as a letterpress, the plates mounted thereon are of cylindrical or tubular form and have a split or longitudinally extending slot. A bar (not shown) extending longitudinally of the cylinder and secured thereto cooperates with the slot in the plate to provide a registration index. A plurality of clamps are utilized to hold the plates on the cylinder. According to the persent invention, a similar cylinder is used in mounting either the relief plate or flexible planographic plate. However, since the flexible planographic plate is much thinner than the relief plate, a dummy plate must be used with the thin planographic plate as a filler when the combination planographic and dummy plate is substituted for the relief plate.

In FIGURES 1, 2, 5, and 6, I have indicated generally the construction of the plate cylinder **16** which is utilized for either letterpress or planographic printing operations. The plate cylinder is journalled at either end with bearings **25** suitably supported on the press (not shown) and is mechanically coupled through a gear train unit **25***a* (FIGURE 1) to the impression roll or cylinder **15** and the driving mechanism. At one end of the cylinder **16** (FIGURES 5 and 6) there are undercut clamping lugs **26** mounted thereon for cooperatively engaging the beveled end of either a relief plate or a dummy plate, both of which are indicated generally by the numeral **16***a*. At the opposite end of the plate cylinder **16**, a fixed undercut clamping ring **26***a* is provided for similarly engaging an adjacent end of a relief plate or a dummy plate **16***a*. In this particular instance, a pair of relief plates or dummy plates **16***a* may be mounted on the plate cylinder **16**. For this reason, a plurality of undercut center clamping lugs **26***b* are also provided for engaging the opposed beveled ends of the respective members **16***a*. The end clamping lugs **26** are mounted on rotatable, axially fixed, clamping rods or bolts **27** disposed in longitudinally extending slots formed in the periphery of the plate cylinder **16**. Turning the clamping bolts **27** by means of a wrench engaging the squared ends **28** thereof will move the clamping lugs **26** longitudinally of the plate cylinder **16**. The center clamping lugs **26***b* are slidably mounted on the rods or bolts **27** and will be moved in accordance with the movable end clamping lugs **26**. The detailed construction of the plate cylinder which is standard, is not of particular importance to this invention other than to indicate the clamping lugs and the clamping ring which are utilized to secure either the type plate or the dummy plate **16***a* to the plate cylinder **16**.

My present invention deals primarily with the arrangement for locating and securing a planographic plate P or similar flexible plate to the cylinder **16** with dummy plates **16***a* thereon. This arrangement includes the longitudinally extending registration and attaching bar assembly **30** which is best shown in FIGURES 1 to 5.

The bar assembly **30** comprises a lower dummy plate locating member **30***a* and an upper plate attaching mem-**30***b*. These members are of sufficient length to produce an assembly which will secure two of the planographic plates P and associated dummy plates **16***a* to the cylinder **16**. The member **30** is of the construction illustrated in FIGURES 3 and 4 and is provided with a pair of re-

cesses **31** in the upper surface on opposite sides of a central divider **31***a*, each of the recesses being adapted to receive one edge of a planographic plate P. The bottom surface of each recess is flat and there is a shoulder **32** at the inner or rear side of each recess, the recess being open at its outer or forward side. The member **30***a* is secured to a surface on the cylinder **16**, which may be flattened, by means of countersunk screws **33** extending through the thick rear edge of the member and screws **34** extending through the thinner or recessed portion of the member. The screws **33** also secure the attaching member **30***b* to the member **30***a* and the cylinder. This member **30***b* extends over the recesses **31** and rests on the central divider lug **31***a* of the member **30***a*. This member provides a free forward leading edge **35** for receiving the hooked edge **36** of the planographic plates P. It will be noted best from FIGURE 2 that the plate edge **36** is hooked to slip over the edge **35** of the member **30***b*. The member **30***a* is beveled at one end to provide a beveled surface **37** which fits under the undercut surface of the ring **26***a*.

Substantially no modification of the letterpress-type plate cylinder is required to attach this bar assembly **30** thereto. It is substantially of the same width as the usual registration bar and the bolt or screw holes are located in approximately the same positions. The thickness of this bar assembly and its length are the same as the bar usually provided on the cylinder when it is used as a letterpress cylinder.

In planographic printing operations, a dummy plate **16***a* is utilized with this bar assembly. The dummy plate also has a wall thickness greater than the height of the bar, but the thickness thereof will be less than that of the letter-type cylinder. The difference in thickness will be equal to the thickness of the planographic plate P. Thus, whichever type of printing is desired, the surface of the letter-type cylinder or the planographic plate **16***a* will be of the same distance from the plate cylinder to properly engage the impression roll or cylinder **15**. The leading edges of each of the dummy plates **16***a* will engage the stop or member **30***a* whereas its trailing edge will be spaced therefrom to permit expansion as shown best in FIGURE 2.

The attachment of the planographic plate P is best shown in FIGURES 7 to 10. This edge or hook **36** of the planographic plate is placed over the member **30***b*, as indicated in FIGURE 7. The planographic plate is then wrapped around the plate cylinder as indicated in the successive FIGURES 8 and 9 and the trailing edge is finally pushed into the respective recess **31** beneath the bar or member **30***b*. Preferably, there will be a space between the trailing edge of the plate and the vertical wall or shoulder **32** of the bar **30***a*. With this type of bar assembly, rotation of the plate cylinder **16** will continuously force the trailing edge of the planographic plate P farther into the recess of the bar assembly since it is free to move relative thereto. The resiliency of the plate P itself, which is bent when inserted into the recess **31**, aids in keeping it in the recess.

It will be apparent from the above that this invention provides a bar assembly for attaching a flexible plate to a plate cylinder. This assembly can be substituted for the usual bar provided on the cylinder when it is used in a letterpress printing operation. Therefore, when the press has an attachment like that disclosed in my patent, it can be used as a letterpress or a flexible plate press and the plate mounted on the cylinder can be a letterpress-type plate or a flexible plate as desired. When the bar assembly secures the flexible plate to the cylinder, it does so in such a manner that tension created on the plate during the printing operation will more firmly engage the hook thereof with the attaching bar and cause the plate to more tightly embrace the dummy plate carried by the cylinder.

According to the provisions of the patent statutes, the principles of this invention have been explained and have been illustrated and described in what is now considered to represent the best embodiment. However, it is to be understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

Having thus described my invention, what I claim is:

1. In combination with a plate cylinder for use in printing, an attaching bar extending across the cylinder and being secured thereto, a dummy plate on the cylinder having edges on opposite sides of the bar, said bar having an attaching free leading edge and a recess below the edge opening at said edge at a level below the outer surface of the dummy plate, a flexible plate wrapped around the dummy plate on the cylinder having a hook-shaped leading edge which fits around said free leading edge of the bar, said plate also having a free trailing edge which extends into said recess and tucks under the free leading edge of the bar with the hooked plate edge thereon whereby said trailing edge may move relative to said bar.

2. In combination with a plate cylinder for use in printing, an attaching bar assembly extending across the cylinder, said bar assembly comprising an inner bar secured to the cylinder, an outer bar secured to the inner bar and having its leading edge free and spaced outwardly from the inner bar to provide a slot therebetween opening toward said leading edge, a dummy plate on the cylinder having edges on opposite sides of the bar assembly and having one edge engaging the inner bar at its trailing edge and having its other edge spaced from the leading edge of the outer bar, said bar assembly being of less thickness than the dummy plate, a flexible plate wrapped around the dummy plate on the cylinder having a hook-shaped leading edge which fits around said free leading edge of the bar, said plate also having a free trailing edge which extends inwardly over the trailing edge of the dummy plate and into said slot beneath said outer plate and being free to move relative to said plate.

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