Sept. 9, 1958 G. R. BRODIE 2,850,971

LOCK-UP

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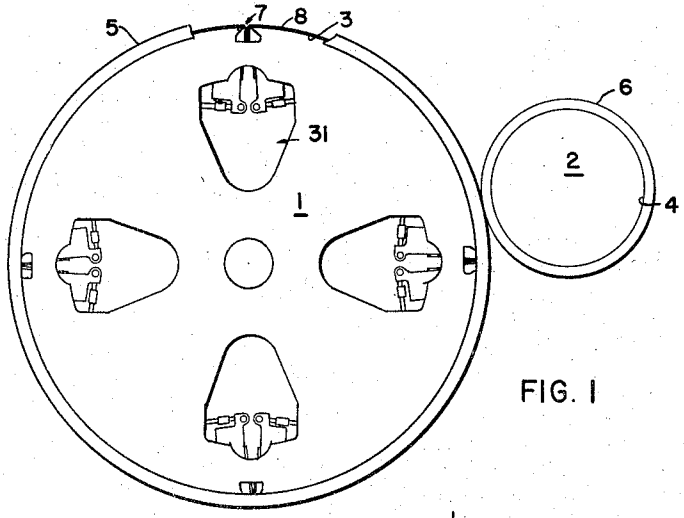


FIG. 1

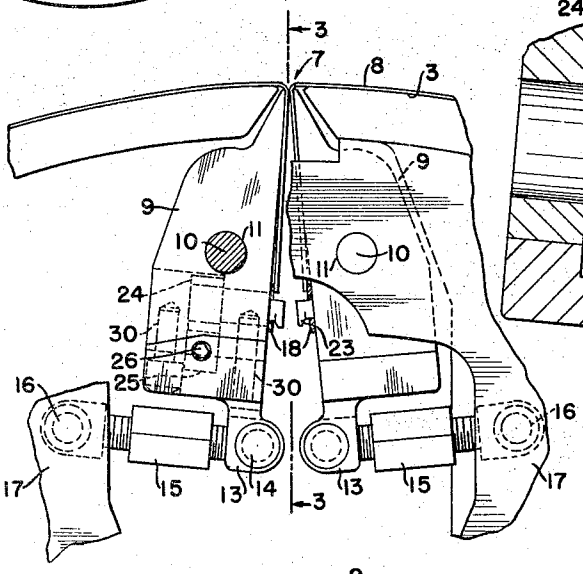


FIG. 2

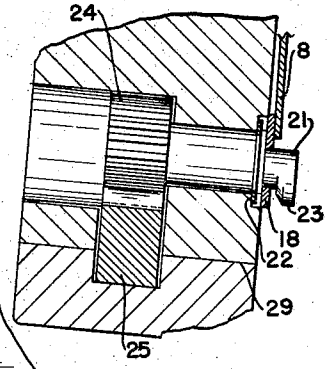


FIG. 4

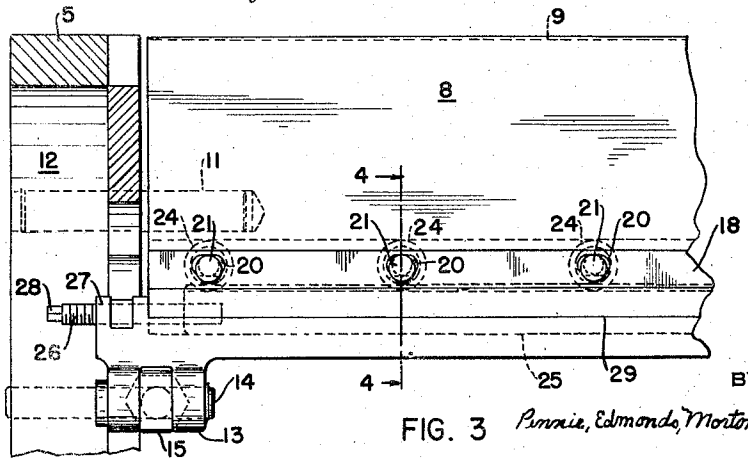


FIG. 3

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LOCK-UP

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4 Claims. (Cl. 101—415.1)

This invention relates to improvements in rotary web-fed printing presses, and more particularly, to improvements concerning the adapting of the impression cylinder of the press to accommodate webs of different thicknesses and the protecting of the surfaces of the impression cylinder from wear or other damage. The invention is especially useful in conjunction with presses for offset printing but may also be used with advantage in conjunction with presses adapted for letter-press work.

In offset printing, for instance, the web is passed between the peripheral surfaces of the so-called impression cylinder and a rotating offset blanket to which the ink impression has been applied by the printing plate and which is wrapped around the peripheral surface of a blanket cylinder and applies the ink impression to the web.

For superior printing, it is essential that the contact betwen the web and the blanket be uniform and nicely adjusted. This contact will depend upon the spacing of the peripheral surface of the impression cylinder from that of the blanket and also upon the thickness of the web.

Customarily, at each end of the impression cylinder and of the blanket cylinder there is provided a so-called bearer ring extending longitudinally from the working surface of the cylinder and of slightly greater diameters than those of the respective cylinder. Because of their greater diameters, these bearer rings determine the minimum spacing between the peripheral surfaces of the impression cylinder and blanket cylinder, respectively, thus providing space between the peripheries to allow for the thickness of the blanket and the thickness of the web.

Where changes in the thickness of the web are contemplated, means must be provided for varying the spacing between the peripheral surface of the impression cylinder and that of the blanket. Also, should the peripheral surface of the impression cylinder be subjected to wear, which would tend to increase the spacing between its periphery and that of the blanket, means must be provided for readjusting the periphery of the impression cylinder with respect to that of the blanket.

To meet these conditions, it has been proposed to change the so-called travel line on the impression cylinder by covering the peripheral surface of the cylinder with a thin metal sheet or plate which is replaceable from time to time as required, either because of wear or because of a contemplated change in web thickness.

The present invention provides improved and effective means for securing such plates to the impression cylinder whereby the plates can be readily removed and replaced by plates of like or different thickness as required.

This means for securing the plate to the impression cylinder will sometimes be referred to herein as a lock-up. In presses employing an impression cylinder of relatively small diameter, a single lock-up will usually suffice. However, in modern multicolor presses, where impression cylinders of relatively large diameter are used, the surfaces of the impression cylinder may be covered by a plurality of separate sheets, necessitating the use of an equal

number of lock-ups, as hereinafter more fully described.

The invention will be further described and illustrated with reference to the accompanying drawings which represent conventionally and somewhat diagrammatically, a particularly advantageous embodiment of the invention in conjunction with an impression cylinder employing four separate lock-ups, and of which

Fig. 1 is a diagrammatic end view of the impression cylinder and a cooperating blanket cylinder, the impression cylinder being partly broken away to indicate the positions of the lock-up assemblies and the plates secured to the cylinder,

Fig. 2 is an enlarged end view of the lock-up assembly showing a portion of the cylinder structure,

Fig. 3 is a side view of the lock-up along the line 3—3 of Fig. 2, and

Fig. 4 is a further enlarged side view of means for fastening the end of one of the plates in the lock-up.

In Fig. 1, the impression cylinder is represented at 1 and a blanket cylinder at 2. There may, of course, be a plurality of blanket cylinders, particularly in multi-color printing. The spacing between periphery 3 of the impression cylinder and periphery 4 of the blanket cylinder is determined by the outside diameters of the bearer rings 5 and 6. The difference between the diameters of the bearer rings and of the cylinders is usually quite small but has been exaggerated in the drawings for clarity.

In the periphery of the impression cylinder, there is provided one or more narrow longitudinal slots 7 adapted to receive the ends of a plate or plates 8. Where more than one plate is to be used, these slots may be evenly spaced about the circumference of the cylinder, for instance, where each quadrant of the cylinder is to be covered by a separate plate, four slots will be provided spaced 90° apart and a separate lock-up assembly will be provided beneath each slot.

Positioned within the cylinder beneath slot 7, are two jaw-like members 9 extending the entire length of the slot and pivoted about points 10. At their upper ends, these jaws are tapered toward each other to a rigid edge to permit their projecting through the slot a distance just short of the periphery of the cylinder, say about .03 inch. These jaws 9 and their pivot points 10 should be of sufficiently rigid structure to prevent their distortion under severe strain occasioned by the tightening of the plate about the cylinder.

The pivot points 10 are rigidly supported by the cylinder structure. In the apparatus shown, the respective jaws are pivoted on rigid pins 11 projecting into each end of the jaw and supported by an inner portion of the bearer ring forming the end structure 12 of the cylinder.

The lower end of each jaw is provided with a lug 13 to which there is fastened, by means of a pin 14, one end of a turn buckle 15. The other end of the turn buckle is fastened by means of pin 16 to the rigid structure of the cylinder indicated at 17.

Each end of the plate to be fastened to the cylinder is bent at a substantially 90° angle, as shown in Fig. 2, so as to project inwardly through the slot 7 and a relatively heavy gauge metal strip 18, of a length equal to the width of the sheet, is secured to each end of the sheet, as by welding.

Uniformly spaced along the length of the strip 18, there is provided a number of holes 20 so spaced and of such size as to coincide with, and fit over, the rotatably mounted locking posts 21.

These locking posts 21 are spaced at intervals along the jaw, for instance on about 6 inch centers, and are nicely rotatably fitted into holes bored into the face of the jaw and held therein against longitudinal movement by snap rings 22. The outward extension of the locking posts is eccentrically positioned with respect to the axis

of rotation of the portion fitting into the jaw and is provided with a lip **23**.

The inner end of each locking-post is secured to a spur gear **24**, each being adapted to engage, and to be turned by a rack **25** extending longitudinally through the jaw over substantially the length thereof. By moving the rack in a longitudinal direction, each locking-post is turned simultaneously either to the locked or unlocked positions.

Longitudinal movement of the rack may be effected in any suitable manner. A particularly advantageous means for effecting such longitudinal movement is by a rotatable shaft **26** threaded into an outer end of the rack and held against longitudinal movement by shoulders **27**. The outer end of the shaft is adapted at **28** to be turned by means of a wrench or the like, thereby moving the rack longitudinally and causing the locking posts to rotate.

In order to simplify the fabrication of the jaws, especially with respect to providing a way for the rack **25**, the jaws are with advantage made of two parts joined together at line **29**, the lower section of the jaw being secured to the upper section by screws **30**.

In placing the plates on the cylinder, the jaws will be moved by means of the turn buckles, which are readily accessible from the end of the cylinder through openings **31**, to a position in which their outer ends are spaced apart a maximum distance. An end of the plate, prebent as shown, and secured to strip **18**, is inserted through slot **7** and the holes in the strip **18** are slipped over the corresponding locking posts **21**, the latter having been turned to the unlocked position.

Where a single plate is used, the other end of the plate is then secured to the other jaw and the ends of the plate are then pulled tightly over the outer end of the jaw by turning the eccentrically positioned locking posts, as previously described, to the locked position.

Having secured both ends of the plate to respective jaws, the plate is tightly drawn about the periphery of the cylinder by forcing the otuer ends of the jaws together by means of the turn buckles, leaving a minimum gap at the seam of the plate.

By means of the lock-up assembly of my invention, the plates may be readily and quickly changed and the new plates accurately adjusted to the periphery of the cylinder, all by means readily accessible to the operator. The plates can be drawn tightly and smoothly about the cylinder and about the edges of the slots with a minimum loss of printing area at the seams. Lock-up slots of an overall width of the order of ½ inch have been found adequate in most instances.

It will be apparent to the skilled mechanic, in view of my foregoing disclosure, that various means equivalent to those shown may be employed for actuating the locking-posts and the jaws without departing from the spirit of my invention, all such equivalents being within the scope of my invention as defined by the appended claims.

I claim:

1. A lock-up assembly adapted to fasten thin metal plates about the periphery of an impression cylinder, having a narrow longitudinal slot in the periphery thereof

adapted to receive the ends of the plate, comprising a pair of rigid jaws positioned within the cylinder beneath the slot, coextensive in length with that of the cylinder, each tapered to a rigid edge at its outer end, the tapered ends extending outwardly through the slot to just short of the peripheral surface of the cylinder, each jaw being pivotally supported by the cylinder structure at a point intermediate its outer and inner ends, the face of each jaw adjacent the other jaw of the pair being provided with a plurality of spaced, rotatably mounted, outwardly extending locking posts adapted to extend through holes in the end of the sheet, means extending longitudinally through the respective jaws for simultaneously rotating said posts about their respective longitudinal axes, thereby locking the sheet onto said posts, and manually operated means accessible through an end of the cylinder for independently rotating each jaw about its pivotal support.

2. The lock-up of claim 1 in which the means for independently rotating each jaw about its pivotal support comprises a turn buckle, pivotally attached at one end to the inner end of the jaw and pivotally attached at its other end to the cylinder structure.

3. A lock-up assembly adapted to fasten thin metal plates about the periphery of an impression cylinder being a narrow longitudinal slot in the periphery thereof adapted to receive the ends of the plate, comprising a pair of rigid jaws positioned within the cylinder beneath the slot, coextensive in length with that of the cylinder, each tapered to a rigid edge at its outer end, the tapered ends extending outwardly through the slot to just short of the peripheral surface of the cylinder, each jaw being pivotally supported by the cylinder structure at a point intermediate its outer and inner ends, a plurality of locking posts spaced along the face of each jaw nearest that of the other jaw of the pair, said posts being adapted to be rotated and provided with an eccentrically positioned outwardly extending member adapted to fit through corresponding holes in the end of the plate, means for simultaneously rotating said posts and thereby drawing the end of the plate inwardly, and means accessible from an end of the cylinder for forcing apart the inner ends of the respective jaws.

4. The lock-up of claim 3 in which the means for simultaneously rotating the locking posts comprises a rack extending longitudinally through the jaw, a gear attached to the inner end of each post adapted to cooperate with said rack and means for effecting longitudinal movement of the rack with respect to the jaw.

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