Sept. 9, 1958 G. R. BRODIE 2,850,970

LOCK-UP

Filed April 21, 1955 2 Sheets-Sheet 1

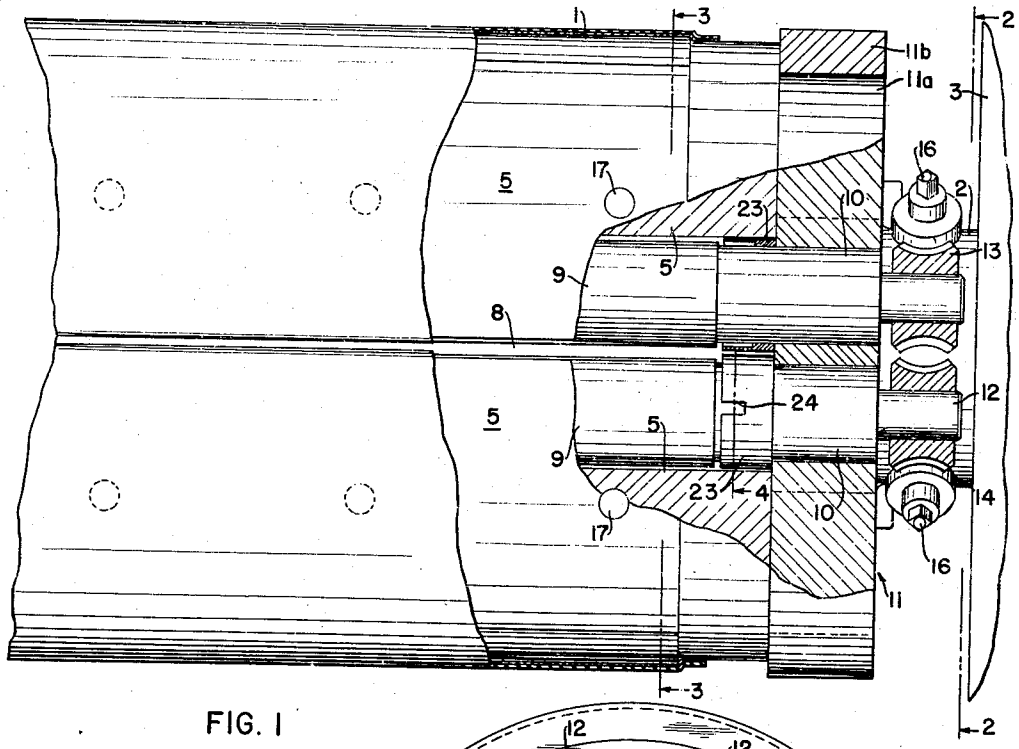


FIG. 1

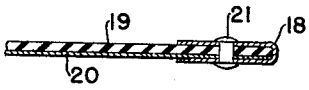


FIG. 5

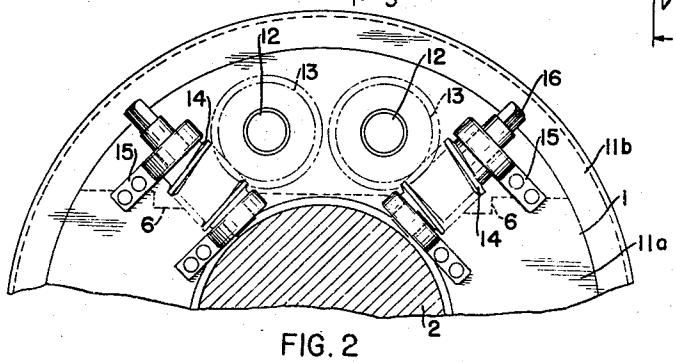


FIG. 2

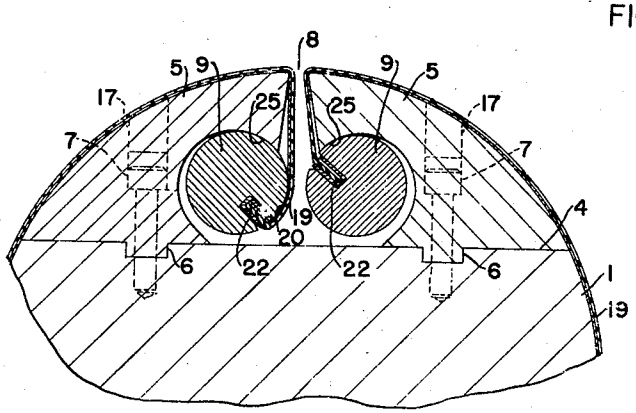


FIG. 3

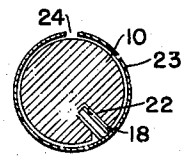


FIG. 4

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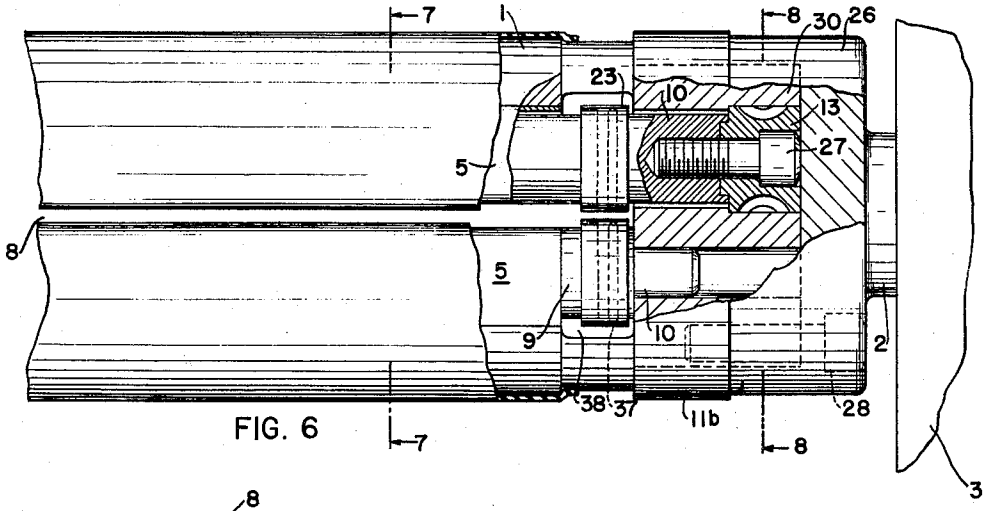


FIG. 6

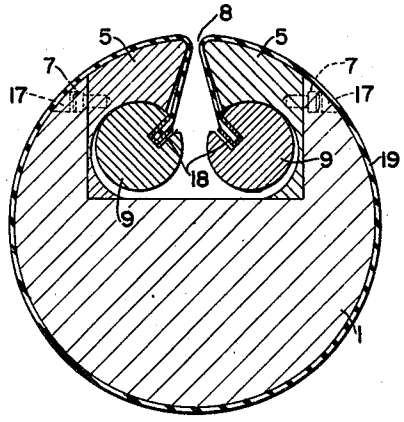


FIG. 7

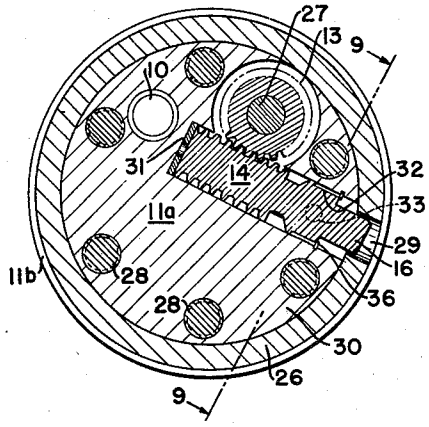


FIG. 8

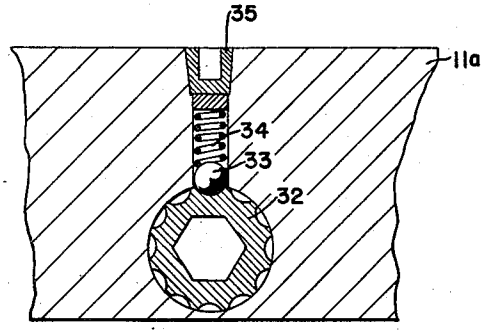


FIG. 9

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2,850,970

LOCK-UP

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Application April 22, 1955, Serial No. 503,134

2 Claims. (Cl. 101—415.1)

This invention relates to improvements in rotary, web-fed printing presses and more particularly, presses of that type adapted to offset printing, by which the ink impression is applied by printing plates to so-called blankets secured about the peripheries of blanket cylinders rotating in contact with the web and which apply the ink impression to the web.

The blanket cylinders are usually of steel or other metal and the blankets are customarily of rubber. The present invention provides improved means for removably fastening and adjusting the blankets on the blanket cylinders.

As is well understood in the printing art, it is necessary that the blanket be free from wrinkles and fit snugly over the periphery of the blanket cylinder, and that tension on the blanket be substantially uniform, in order to produce printed matter of superior quality. In modern web-fed presses, the blanket cylinders are operated at high speed and the blankets must be so secured to the cylinders as to avoid any loosening, change in tension or wrinkling under operating conditions.

It has heretofore been proposed to secure the blankets to the blanket cylinders by wrapping the blanket around the periphery of the cylinder and tucking its ends into a slot in the periphery of the cylinder. Various means have been proposed for securing the ends of the blanket in the slot. Means previously proposed for that purpose have necessitated slots and blanket seams of objectionably great width and have therefore resulted in considerable loss of effective printing surface of the blanket cylinder with a resultant waste of paper web.

In accordance with my present invention, these and other defects and objections encountered with respect to previously proposed blanket lock-ups are avoided and other advantages obtained, as will appear from the following detailed description of my improved lock-up mechanism.

The invention will be described and illustrated with reference to the accompanying drawings, which represent a particularly advantageous embodiment of the invention and of which:

Fig. 1 is a fragmentary side view of a blanket cylinder, partly broken away to show the blanket lock-up mechanism,

Fig. 2 is a fragmentary end view along the line 2—2 of Fig. 1,

Fig. 3 is a fragmentary transverse section along the line 3—3 of Fig. 1,

Fig. 4 is a transverse section along the line 4—4 of Fig. 1,

Fig. 5 is a longitudinal section of one end of the blanket assembly,

Fig. 6 is fragmentary side view of a blanket cylinder partly broken away to show a somewhat modified form of blanket lock-up,

Fig. 7 is a transverse section along the line 7—7 of Fig. 6,

Fig. 8 is a transverse section along the line 8—8 of Fig. 6, and

Fig. 9 is a fragmentary section along the line 9—9 of Fig. 8.

In the following description of the apparatus like elements will be identified by like reference numerals.

Referring more particularly to Figs. 1 to 5, inclusive, of the drawings, a blanket cylinder of solid construction is represented at 1. This blanket cylinder is supported at each end by journals 2 rotatably mounted in the press side frames 3. The cylinder is adapted to be rotated by means not shown.

As more clearly shown in Fig. 3, a portion of the cylinder is cut away over its entire length along the line 4 and the cut-away portion is replaced by the blanket lock-up assembly also extending the entire length of the cylinder.

The outer face of the lock-up assembly is formed by two rigid face-plates 5, each keyed to the cylinder along its entire length as indicated at 6 and secured to the cylinder by screws 7 spaced apart over the length of the cylinder.

These face-plates are spaced apart at their outer surfaces, as indicated at 8, to form a radially extending groove runing longitudinally the entire length of the cylinder. The inner portions of the face-plates are cut away as shown in Fig. 3 to accommodate the two rollers 9, sometimes herein designated reel rollers.

These reel rollers extend the entire length of the cylinder and are supported at each end by journals 10 rotatably mounted in the bearer rings 11, which extend longitudinally from each end of the cylinder, and are secured, as by shrinking, to the supporting shaft of the cylinder. These bearer rings are composed of a central portion 11*a* of forged steel with an outer collar 11*b* of hard steel alloy. It will be understood that the slot 8 and face plates 5 do not extend beyond the inner face of the bearer rings. Reference herein to the length of the cylinder will be understood to mean the length of its effective printing surface.

The journals 10 of the reel rollers extend at one end, at somewhat reduced diameter, beyond the bearer ring as indicated at 12 and to each there is secured a worm gear 13, each worm gear cooperating with a worm 14 rotatably mounted on the bearer ring 11 by brackets 15. The outer end of each of worms 14 is adapted, as indicated at 16, to cooperate with a wrench or other removable means for turning the worm and thereby rotating the respective reel rollers through the cooperating worm gears 13. These worms are readily accessible to the operator.

After securing the lock-up assembly to the cylinder by means of screws 7, the counter-bored screw holes 17 are plugged with metal and the surfaces of the face plates accurately ground to conform with the curvature of the cylinder.

It is essential that each of the reel rollers be provided with means for securing an end of the blanket thereto. Since the blanket must be removed and replaced from time to time, it is particularly desirable that the respective ends of the blanket be readily secured to and disengaged from the reel rollers. In order to obtain even tension on the blanket, it is important that the engagement of the blanket ends with the respective rollers be along a straight line perpendicular to the side edges of the blanket.

In accordance with my present invention, this is accomplished with particular advantage by first securing the respective ends of the blanket, cut to the required length, to a metal strip such for instance as indicated at 18 in Fig. 5. The blanket there represented is composed of an outer sheet of rubber 19 and an underlying sheet of

felt 20. Advantageously the felt sheet is somewhat shorter than the rubber sheet and is secured to the metal strip 18 only at one end, for reasons which will hereinafter appear. The metal strip 18 is with advantage U-shaped as shown in the drawing, the blanket fitting within the strip and being secured thereby by means of rivets 21 spaced at short intervals, advantageously on about 2 inch centers, along the width of the blanket. For reasons which will hereinafter appear, the length of the metal strip should be somewhat greater than the width of the blanket so as to project beyond each side edge of the blanket a distance of about 1 inch or more.

Each of the reel rollers 9 is slotted longitudinally over its entire length, as indicated at 22, Fig. 3, the width and depth of the slot being such as to receive the metal strip 18, secured to one end of the blanket.

In applying the blanket to the cylinder, the reel rollers are rotated, by means previously described, so that the slots 22 of both rollers are in the position indicated by the right hand reel roller of Fig. 3. The metal strip, to which both felt and rubber sheets have been fastened, is passed through the slot 8 in the periphery of the cylinder and inserted in the slots 22 of one of the reel rollers, for instance the left hand roller. This operation is greatly facilitated by the extensions of the metal strip beyond the blanket edges. These strip extensions also serve to lock the strip in the groove 22.

This locking is, with particular advantage, accomplished by extending the groove 22 to the full length of the strip and providing a slip collar on an end extension of roller 9 beyond the blanket edge, as indicated at 23 of Fig. 1. This collar may be provided with a slot 24 and adapted to be rotated to bring slot 24 in register with groove 22 when it is desired to insert the strip 18 therein, or remove it from groove 22, and the collar is turned so that slot 24 is not in register with groove 22 when it is desired to lock strip 18 in the groove. Any suitable means may be provided for rotating the collar, for instance pin holes made readily accessible to the operator by a recess in the end extension of the cylinder. Advantageously, a collar of this type is provided with a spring arrangement, not necessary here to describe, which tends to hold the collar in the locked position. Other types of locking mechanism may be provided, for instance a collar adapted to slide longitudinally to engage or disengage the ends of the metal strip 18.

After locking the strip 18 in position in groove 22, that reel roller to which the blanket has been attached may be turned to a position such as that of the left hand reel roller shown in Fig. 3. The felt and rubber sheets are then smoothly wrapped about the cylinder, the loose end of the felt sheet tucked into slot 8 and the metal strip attached to the remaining end of the blanket inserted in groove 22 of the right hand reel roller and locked in position as previously described.

The blanket may then be tightened about the periphery of the blanket cylinder by turning one or both of the reel rollers in the appropriate direction to pull the blanket downwardly through the slot 8 until the desired blanket tension is obtained.

Blanket cylinders used on modern presses are frequently of considerable length, of the order of 5 feet or more, especially in modern so-called double-ender presses. When the blanket is placed under considerable tension, there is a tendency, especially where long reel rollers are used, for the reel roller to yield at its intermediate portion thus causing less tension toward the middle of the blanket than toward the blanket edges.

An important aspect of the present invention is the avoidance of this tendency without unduly increasing the diameter and weight of the reel rollers. This is accomplished, in accordance with my present invention, by so constructing the blanket lock-up that the reel rollers, over their entire length, bear at their outer periphery, upon the corresponding rigid face plate 5, as indicated in Fig. 3 at 25. By so supporting the reel rollers against buckling, a uniform tension through the width of the blanket may be obtained.

A modified construction of the blanket cylinder and lock-up assembly is shown in Figs. 6 to 9, inclusive of the drawings.

In this modification, the lock-up assembly is fitted into a space milled into the surface of the blanket cylinder, as more clearly shown in Fig. 7, and the worms and worm gears for rotating the reel rollers are enclosed within a housing 26 constituting a longitudinal extension beyond the bearer ring at each end of the blanket cylinder.

The worm gears are secured to opposite ends of the respective reel rollers by means of screws 27 and the housings are secured to the bearer rings by means of screws 28. Access to the worm, by means of wrench or the like, is through opening 29 in the periphery of the housing 26.

The worms 14 and the worm gears 13 are fitted into recesses bored into an outward extension 30 of the inner portions of the bearer ring and the lower ends of the worms bear on thrust washers 31.

Friction between the worm and worm gear is frequently sufficient to prevent any loosening of the blanket in operation. However, any suitable means may be provided where necessary for locking the worm in the set position, for instance, a ball and spring detent such as represented in Fig. 9 comprising a fluted member 32, and a steel ball 33 urged against the flutes by compression spring 34, the tension on which is adjustable by means of pressure plug 35. The worms may be held against outward movement by means of snap rings 36.

The arrangement of the locking collars 23 may be substantially as heretofore described, the collars being held in the locked position by springs indicated at 37 and access to the collars is obtained through recess 38 in the end extension of the cylinder.

By reason of the novel design and construction of my improved lock-up, substantially the entire periphery of the blanket cylinder is available for printing, the only unusable area being that overlying the slot 8 at the seam of the blanket which may be of a width of the order of ½ inch. The blanket lies smoothly over the face plates on either side of the slot and irregularities, which might cause defects in printing or bumping in operation, are avoided. In adjusting the blanket, it may be pulled from each end and thus substantially uniform blanket tension over the entire periphery of the blanket cylinder readily obtained.

I claim:

1. A mechanism for securing and adjusting the blanket about the periphery of a blanket cylinder used in offset printing, comprising two rigid face plates having their outer surfaces flush with, and constituting a portion of, the peripheral surface of the cylinder, coextensive in length with that of the cylinder and spaced apart to form a narrow longitudinal slot in the periphery of the cylinder, two rotatably mounted rollers positioned within the cylinder beneath the respective face plates, on either side of the slot, the peripheral surface of the respective rollers nearest the slot bearing upon an inner surface of the corresponding face plate over substantially the length of the roller, each roller being provided with a relatively narrow longitudinally-extending slot of substantially rectangular cross-section extending inwardly from the periphery thereof only partway through the roller, the depth of the slot being greater than its width, said slot being adapted to receive a metal strip secured to one end of the blanket and extending outwardly beyond each side edge of the blanket, the length of said slot being at least equal to that of the strip, means adapted to cooperate with the extending ends of the strips for latching them within the slots, and means independent of said last-mentioned means for separately rotating the rollers about their respective axes.

2. The mechanism of claim 1 in which the latching means is a slip collar movably mounted about an end-extension of the roller.

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