June 3, 1952 L. M. STEMPEL 2,598,726

RESILIENT BEARER STRUCTURE FOR ROTARY PRINTING PRESSES

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FIG. 1

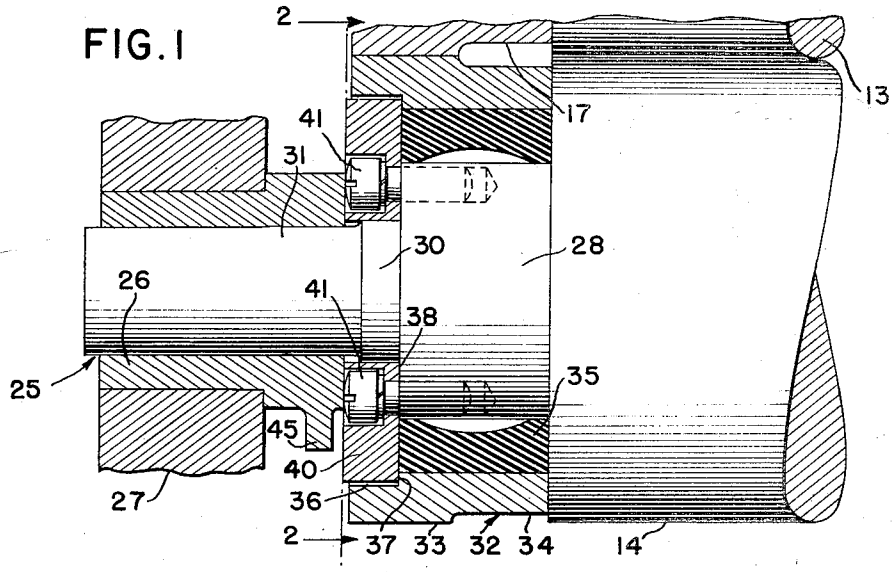
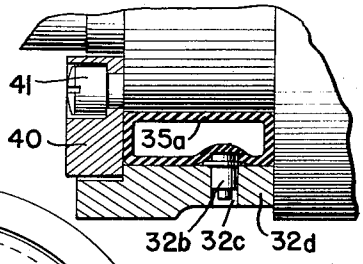


FIG. 4



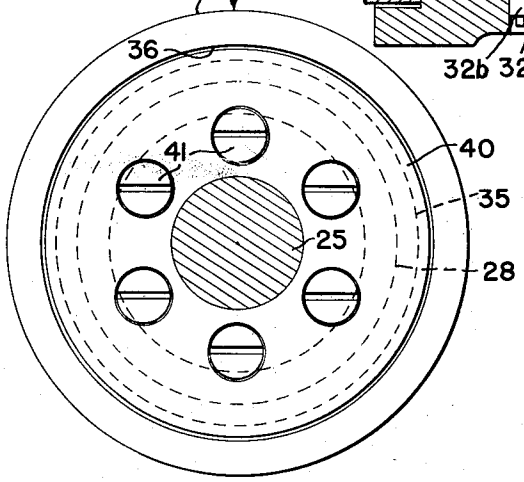
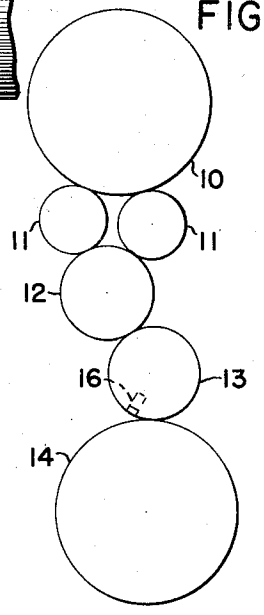


FIG. 2

FIG. 3



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RESILIENT BEARER STRUCTURE FOR ROTARY PRINTING PRESSES

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8 Claims. (Cl. 101—217)

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The present invention relates to printing presses and more particularly to bearer means for the impression cylinder of such presses.

In one type of printing press, there is provided an inking cylinder, a plate cylinder, transfer cylinder or cylinders between said inking cylinder and said plate cylinder, a blanket cylinder in ink transfer contact with said plate cylinder and an impression cylinder in contact with said blanket cylinder for pressing the web to be printed against said blanket cylinder. The blanket cylinder is provided with a slot extending therealong on its outer periphery to receive the conventional wedge or clamp by which a rubber plate or blanket is fastened to said blanket cylinder. In such an arrangement, during each revolution of the blanket cylinder, when the blanket clamping slot on said cylinder moves opposite the impression cylinder, the failure of said impression cylinder to support said blanket cylinder at that instant, causes said blanket cylinder to drop slightly towards said impression cylinder, depending on the looseness of the bearings for said blanket cylinder. This is immediately followed by an upward movement of the blanket cylinder as its blanket clamping slot moves beyond opposed position with respect to the impression cylinder and the circular periphery of said blanket cylinder is moved again into contact with said impression cylinder. This causes the blanket cylinder to be knocked against the plate of the plate cylinder, so that said plate becomes eventually worn along a longitudinal section thereof. This results in the formation of a smudge on the web being printed.

One object of the present invention is to provide new and improved bearer means by which the movement of the blanket cylinder towards or away from the impression cylinder resulting from the conventional blanket clamping slot on said blanket cylinder is avoided.

Another object of the present invention is to provide new and improved resilient bearer means by which the movement of the blanket cylinder towards or away from the impression cylinder resulting from the conventional blanket clamping slot on said blanket cylinder is avoided, while permitting adjustments in the position of said impression cylinder with respect to said blanket cylinder to accommodate webs of different thicknesses.

Various other objects will be apparent from the following description and from an inspection of the accompanying drawings, in which

Fig. 1 is a view of one end of an impression

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cylinder showing in axial section the bearing means and the resilient bearer means for said cylinder embodying the present invention;

Fig. 2 is a section of the impression cylinder taken approximately along the lines 2—2 of Fig. 1;

Fig. 3 is a diagrammatic end view of the different cylinders of the printing press of the present invention; and

Fig. 4 is a detail section of a modified form of the invention.

Referring to the drawings, the printing press is shown of the general type having an inking cylinder 10, a pair of transfer cylinders 11 in contact therewith, a plate cylinder 12 in contact with both of said transfer cylinders, a blanket cylinder 13 in contact with said plate cylinder and an impression cylinder 14 in contact with said blanket 13. The plate cylinder 12 has a conventional metal printing plate peripherally secured to the main body of the cylinder by means of a slot (not shown) therein into which the offset edges of said plate are retained by means of a wedge or clamp (not shown). The rubber blanekt on the blanket cylinder 13 is similarly retained on the main body of said cylinder by means of a clamp or wedge (not shown) in a slot 16 in said cylinder body.

The blanket cylinder 13 is provided with a conventional bearer ring 17 at each end engaging with a corresponding bearer ring (not shown) at each end of the plate cylinder 12 to prevent relative movement of said cylinders towards or away from each other. However, since the retaining clamp or wedge in the slot 16 of the blanket cylinder 13 is ordinarily set radially inwardly from the outer periphery of the blanket, said cylinder will drop towards the impression cylinder 14 each time said slot moves directly opposite said impression cylinder and moves upwardly immediately after said slot moves beyond said position. To avoid the resulting intermittent knocking of the blanket cylinder 13 against the plate cylinder 12 and the consequent wear of the plate on said latter cylinder, there is provided new and improved bearer means on each end of the impression cylinder 14.

In the form of the invention shown, the impression cylinder 14 is provided at each end with a shaft 25 integral or otherwise secured to said cylinder and journalled in a bushing 26 in a side frame 27. This shaft 25 has a section 28 nearest the end of the impression cylinder 14 of largest diameter, an intermediate section 30 of smaller diameter and an end journalled section 31 of

smallest diameter. Encircling this shaft 25 is a cylindrical bearer sleeve 32 of metal having an active supporting outer end section 33 engaging the active supporting outer end section of the bearer ring 17 on the blanket cylinder 13 and an inactive inner end section 34 of reduced diameter. A sleeve 35 of rubber or similar resilient material spaces the bearer sleeve 32 from the shaft section 28 and serves for the purpose to be described. This sleeve 35 is shorter than the length of the bearer sleeve 32 but in unstressed cylindrical condition is longer than the length of the shaft section 28 and fits snugly between said bearer sleeve and said shaft section.

In order to retain the bearer sleeve 32 and resilient sleeve 35 in position on the cylinder shaft 25, the end of the bore of said bearer sleeve is enlarged to form a recess 36 presenting an annular shoulder 37 in alignment with the plane of the outer end or shoulder 38 of the shaft section 28, when said bearer sleeve engages the end of the impression cylinder 14, as shown in Fig. 1. This recess 36 receives a circular retaining or clamping plate 40 by means of studs 41 threaded into the shaft section 28. This clamping plate 40 encircles the intermediate shaft section 30 and when in limiting position engages the shaft shoulder 38 and comes close to the shoulder 37 in the recess 36 of the bearer sleeve 32. In this limiting position of the clamping plate 40, the bearer sleeve 32 abuts the end of the impression cylinder 14 and the resilient sleeve 35 is compressed axially so that it bulges radially outwardly as shown.

The plate 40 is clamped tight against the shaft shoulder 38 and against the end of the resilient sleeve 35, but in this limiting position it engages the shoulder 37 in the recess 36 of the bearer sleeve 32 lightly if at all, so that this bearer sleeve has a floating support due to said resilient sleeve without restriction against radial movement either from the end of the impression cylinder 14 or from said clamping plate.

The printing cylinders are set-up, so that the bearer sleeves 32 on the impression cylinder 14 are pressed upwardly against the respective bearer rings 17 on the blanket cylinder 13. In this operative position, the resilient sleeves 35 are stressed radially to urge the bearing sleeves 32 upwardly towards the respective bearer rings 17 on the blanket cylinder 13, even though the axis of the impression cylinder 14 should be lowered to accommodate a web of greater thickness.

To vary the distance of the impression cylinder 14 from the blanket cylinder 13, so as to accommodate for sheets of varying thicknesses, the bushing 26 is in the form of an eccentric having a lever 45 by which it may be rotated. When it is desired to adjust the position of the impression cylinder 14 with respect to the blanket cylinder, the bushings 26 at opposite ends of said cylinder are rotated similar amounts, to move the axis of said impression cylinder towards or away from the blanket cylinder 13. If the eccentric bushings 26 are rotated in a direction to move the impression cylinder 14 towards the blanket cylinder 13, so as to accommodate webs of smaller thickness, this movement of said impression cylinder is effected, while the bearer sleeves 32 due to their resilient floating support maintain their radial position in contact with the bearer sleeve 17 on the blanket cylinder. If the eccentric bushings 26 are rotated in a direction to move the impression cylinder 14 away from the blanket cylinder 13, so as to accommodate webs of greater thickness, the radial stresses on the resilient sleeves 35 urging the bearer sleeves 32 upwardly against the respective bearer rings 17 on blanket cylinder 13, are sufficient to maintain said bearer sleeves 32 still in operative supporting contact with said bearer rings, even though said impression cylinder has been adjustably moved away from said blanket cylinder.

It is seen, therefore, that the blanket cylinder 13 will be supported against dropping action by the contacts of its bearer rings 17 with the bearer sleeves 32 on the impression cylinder 14 and that this support is effective, regardless of the radial adjusted position of the impression cylinder 14 with respect to said blanket cylinder.

In the form of the invention shown in Fig. 4, an inner pneumatic tube 35*a* may be used instead of the sleeve 35 shown in Fig. 1. This tube 35*a* may be inflated through a sleeve stem 35*b* extending through an aperture 36*c* in the bearer sleeve 32*d*.

While the invention has been described with particular reference to a specific embodiment, it is to be understood that it is not to be liimted thereto, but is to be construed broadly and restricted solely by the scope of the appended claims.

What is claimed is:

1. In a printing press, a blanket cylinder, a rigid cylindrical bearer for said blanket cylinder at each end, an impression cylinder coacting with said blanket cylinder, a rigid cylindrical bearer for said impression cylinder at each end cooperating with the corresponding bearer for said blanket cylinder to support said blanket cylinder against radial movement towards said impression cylinder, and means for resiliently supporting the bearers for the impression cylinder for radial movement with respect to said impression cylinder and for maintaining thereby resilient pressure between cooperating bearers, said supporting means acting to resist yieldably movement of the bearers for said impression cylinder in any radial direction.

2. In a printing press, an impression cylinder having a shaft at each end for bearing support, a rigid bearer sleeve at each end of said cylinder encircling the corresponding shaft and adapted to engage with a corresponding bearer of a cylinder coacting with said impression cylinder to support said coacting cylinder against radial movement towards said impression cylinder, a resilient sleeve between each of said bearer sleeves and each of the corresponding shafts for resiliently supporting said bearer sleeve for radial movement with respect to said impression cylinder, to maintain resilient pressure between each of said bearer sleeves and the corresponding bearer engaging said latter sleeve, and a retaining plate clamped against one end of each of said resilient sleeves to maintain said latter resilient sleeve and the corresponding bearer sleeve against axial movement, and to compress said latter resilient sleeve axially to cause said latter resilient sleeve to bulge radially outwardly against the corresponding bearer sleeve without restricting radial movement of each bearer sleeve with respect to its corresponding shaft.

3. In a printing press, the combination as described in claim 2, each of said shafts having an axially facing shoulder against which the corresponding retaining plate abuts, said plate being attached to said shaft by studs passing through said shoulder and threaded into said shaft.

4. In a printing press, an impression cylinder,

a bearer at each end of said cylinder adapted to engage with a corresponding bearer of a cylinder coacting with said impression cylinder to support said coacting cylinder against radial movement towards said impression cylinder, sleeve means for resiliently supporting the bearers for the impression cylinder for radial movement with respect to said impression cylinder to maintain resilient pressure between interengaging bearers, and means for radially adjusting the radial position of said impression cylinder with respect to said coacting cylinder to accommodate for webs of varying thicknesses and to regulate the resilient pressure between contacting bearers.

5. In a printing press, an impression cylinder having a shaft at each end, a bearing for each of said shafts including an eccentric bushing adapted when turned to move the corresponding shaft radially, a bearer at each end of said cylinder adapted to engage with a corresponding bearer of a cylinder coacting with said impression cylinder to support said coacting cylinder against radial movement towards said impression cylinder, and sleeve means for resiliently supporting the bearers for the impression cylinder for radial movement with respect to said impression cylinder to maintain resilient pressure between interengaging bearers, even though the radial position of said impression cylinder has been adjusted through said eccentric bushings.

6. In a printing press, a blanket cylinder, a bearer for said blanket cylinder at each end, an impression cylinder coacting with said blanket cylinder and having a shaft at each end for bearing support, a rigid bearer sleeve at each end of said impression cylinder encircling the corresponding shaft and adapted to engage with a corresponding bearer of said blanket cylinder to support said blanket cylinder against radial movement towards said impression cylinder, and a sleeve of resilient material interposed between each of said bearer sleeves and each of the corresponding shafts for resiliently supporting said bearer sleeve for radial movement with respect to said impression cylinder, to maintain resilient pressure between each of said bearer sleeves and the correspondeing bearer engaging said latter sleeve.

7. In a printing press, the combination as described in claim 6, said resilient sleeve being concentric with its corresponding shaft, said combination comprising means for compressing said resilient sleeve axially to force its entire periphery radially outwardly against its corresponding bearer sleeve.

8. In a printing press, an impression cylinder having a shaft at each end, a bearing for each of said shafts including an eccentric bushing adapted when turned to move the corresponding shaft radially, each of said shafts having a diametrically enlarged inner section presenting an axially facing shoulder, a rigid cylindrical bearer sleeve at each end of said cylinder concentrically encircling the corresponding shaft at its enlarged section and adapted to engage peripherally with a corresponding bearer of a cylinder coacting with said impression cylinder to support said coacting cylinder against radial movement towards said impression cylinder, a resilient sleeve between each of said bearer sleeves and each of the corresponding shafts for resiliently supporting said bearer sleeves for radial movement with respect to said impression cylinder, to maintain resilient pressure between each of said bearer sleeves and the corresponding bearer engaging said latter bearer sleeve, and a retaining plate held against each of said shoulders to compress the corresponding resilient sleeve axially to cause said latter resilient sleeve to bulge radially outwardly against the corresponding bearer sleeve, said retaining plate being large enough to retain the corresponding bearer sleeve against outward axial movement, but being free from pressing engagement with said latter bearer sleeve to permit said latter bearer sleeve to move radially under the pressing action of the corresponding bearer.

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