Nov. 14, 1944. A. WEISS 2,362,735

ROTARY PRINTING PRESS

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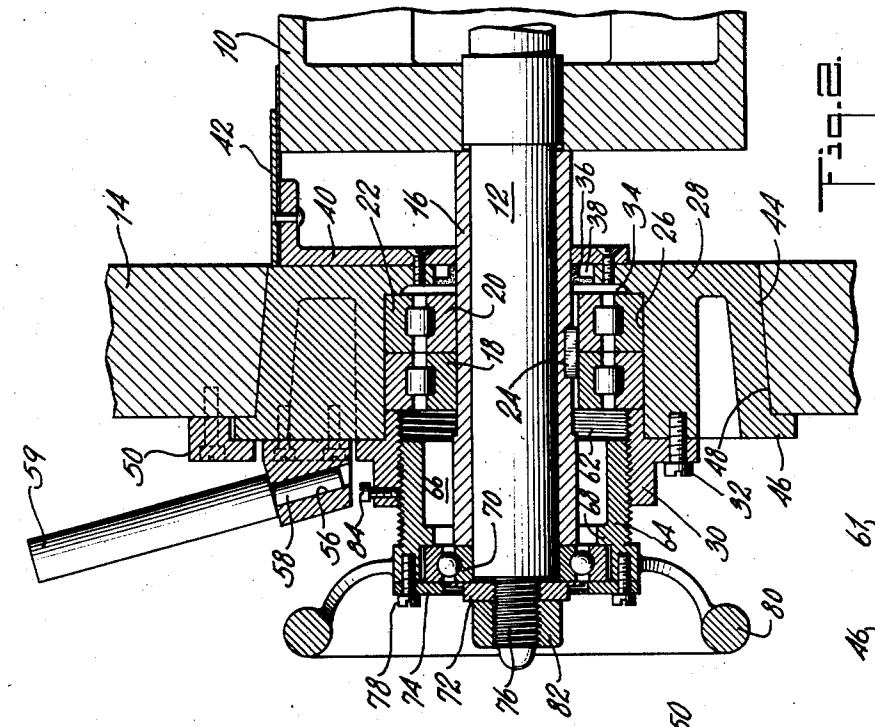


Fig. 2

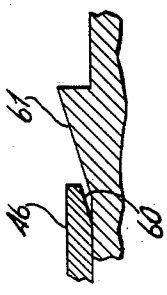


Fig. 3

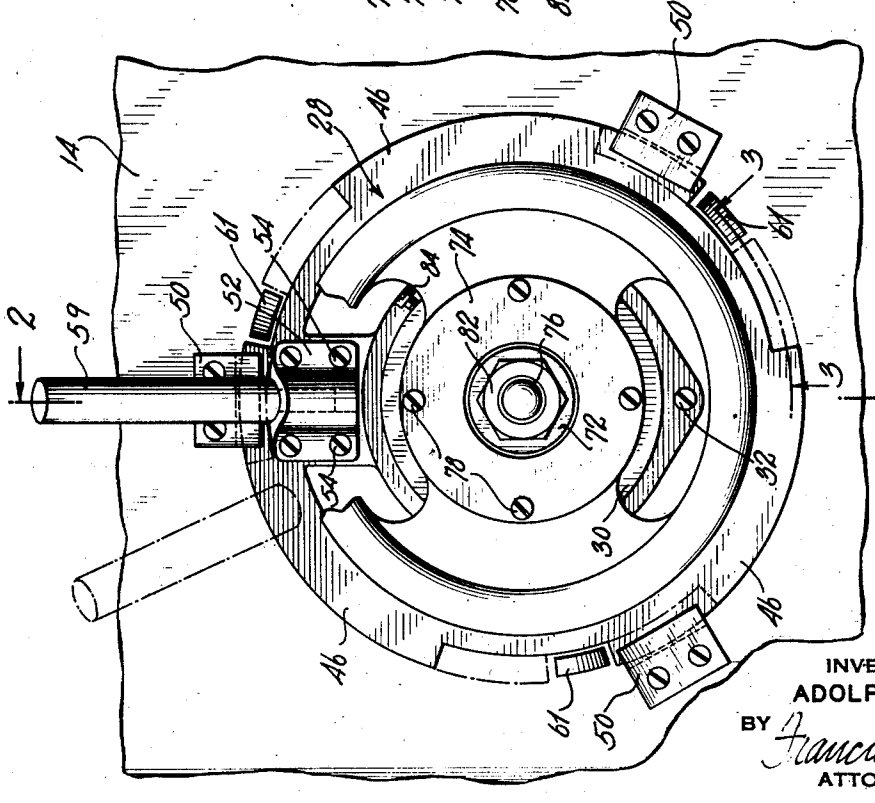


Fig. 1

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ROTARY PRINTING PRESS

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9 Claims. (Cl 101—153)

This invention relates to rotary printing presses and aims to provide an improved removable bearing for the shaft of a rotogravure printing cylinder which includes improved means for axially adjusting said shaft.

In rotogravure printing presses, it is desirable to mount the printing cylinder in such a manner that it may be moved axially for making adjustments in side register and may be easily removed from the frames when it is desired to print different designs or colors. For this purpose, it has been suggested that at least one of the bearings for the printing cylinder shaft be mounted in a tapered housing which may be accurately and tightly secured in a suitable opening in the side frame but easily removed therefrom. To effect the axial adjusting movement of the cylinder shaft for making corrections in side register, means are mounted at the side of the shaft and bearing housing and operatively connected to the shaft. However, such constructions are of necessity rather complicated, often tend to bind during operation due to their being off center, require the disconnection of many parts in order to remove the bearing housing and the cylinder from the frames, and require readjustment when the bearing housing is again placed in operative position after removal. Moreover, when constructions of this character are used in rotogravure printing presses having enclosed ink fountains, they may be complicated even further.

I have invented an improved removable bearing for a rotogravure printing press which is subject to none of these difficulties, is simple in construction, efficient in operation and easily and quickly removable as a unit both from the printing cylinder shaft and from the press frame. In accordance with my invention, the adjusting means for axially moving the printing cylinder shaft are included in the bearing housing and arranged concentrically to the printing cylinder shaft so as to provide a unitary construction which may be removed from the press frame without the necessity of disconnecting any of the operating parts thereof and without disturbing the side register adjustment.

My improved bearing construction thus comprises a tapered cylindrical housing member having a sleeve mounted therein and adapted to receive the printing cylinder shaft. This sleeve is rotatably supported in suitable bearings and operatively connected to a concentrically mounted axially movable cylindrical adjusting member so that it may be moved therewith for effecting any desired corrections or adjustments in side register. The entire housing member and the operating parts included therein may be easily mounted in and removed from a suitable opening provided in the press frames.

An important feature of this construction, in addition to the lack of necessity of disconnecting operating parts when removing the unit, is that after a side register adjustment has been made, the bearing unit may be removed without disturbing the relationship of the parts. Hence, when the bearing unit is replaced after removal, the press is usually ready for operation without further adjustment.

The above and other features and objects of the invention will become apparent upon consideration of the following detailed description and the accompanying drawing, in which:

Fig. 1 is a fragmentary side elevational view of a portion of a rotogravure printing press in which my invention has been embodied; and

Figs. 2 and 3 are vertical sectional views taken substantially along the lines 2—2 and 3—3, respectively, of Fig. 1.

Referring now to the drawing, I have shown one form of construction embodying the essential features of my invention applied to a rotogravure printing press of the general type disclosed in A. Weiss Reissue Patent No. 21,212 to which reference may be made for a more complete description of all parts of the printing press which do not form a part of my invention. Such rotogravure printing presses include an engraved printing cylinder 10 having a shaft 12 rotatably supported in spaced side frames 14. The printing cylinder cooperates with a resilient impression cylinder (not shown) to provide a printing couple through which webs or sheets of the material to be printed may be passed. Although I have shown my invention embodied in a rotogravure printing press of this character, it is to be understood that in its broader aspects said invention may be applied to and embodied in rotary printing presses generally.

As shown in Fig. 2, one end of the printing cylinder shaft 12 is mounted in an elongated bushing or sleeve 16 which is rotatably supported in a double roller bearing 18 having an inner race 20 and an outer race 22. The inner race 20 is keyed at 24 to the sleeve 16 so as to rotate therewith, whereas the outer race 22 is mounted with a press fit in a suitable cylindrical opening 26 provided in a housing member 28 and held therein by means of a flanged cylindrical retaining collar or ring 30. Collar 30 is attached to the housing member by means of screws 32 passing through

the flange thereof. The bottom or inside face of the cylindrical opening 26 is formed with a recess 34 for the reception of a suitable lubricant which is held therein by means of a packing ring 36 mounted in an annular opening 38 and having frictional engagement with the face of said opening and the outside surface of the sleeve 16. In the construction shown, the packing ring 36 is held in place by means of a supporting plate 40 for an end seal 42 which cooperates with the printing cylinder 10 and forms a part of the enclosed ink fountain for said printing cylinder as disclosed in my patent referred to above.

While the housing member 28 may be of any desired shape, I prefer to have it circular and provided with a tapered face 44, corresponding in depth with the thickness of the side frame 14. A plurality of segmental flanges 46 are attached to or formed on the housing member 28 and are adapted to bear against the outside face of the frame 14 and prevent the housing from passing through a tapered opening 48 provided in the side frame 14. In the present instance, I have shown three segmental flanges 46 formed on the outside of the housing member 28. These cooperate with suitable attaching lugs or brackets 50 which are secured in proper position, substantially 120° apart, to the outside face of the frame 14. The attaching lugs 50 and the flanges 46 are constructed and arranged so that when the housing is in the position shown in full lines in Fig. 1, it will be suitably locked and ready for operation of the press. However, upon rotating said housing in a counterclockwise direction through a small arc to the position shown in dot and dash lines in Fig. 1, the flanges 46 will be brought out of engagement with the cooperating brackets or lugs 50 so that said housing may be removed from the tapered opening 48. To facilitate the insertion and removal of the housing 28, it may be provided with a suitable fitting 52 which is attached thereto by means of screws 54 and provided with an angularly disposed opening 56 which is adapted to receive a reduced end 58 of a removable operating handle 59. In addition to this, the flanges 46 may be provided with sloping lower edges 60 for cooperation with sloping cam members 61 to cause the entire housing to be moved outwardly from the frame when rotated in a counterclockwise direction by the handle 59 as indicated in Figs. 1 and 3.

It will be apparent that the construction thus far described provides an efficient removable bearing for the printing cylinder shaft 12 which may be readily removed from the frames and the shaft 12 so that the printing cylinder 10 may be withdrawn from the press through the opening 48 provided in the press frame. According to my invention, the housing 28 also includes and supports means for effecting axial movement of the printing cylinder shaft for making corrections in side register. Such means will now be described.

In Fig. 2, it will be noted that the inside surface of the retaining collar 30 is provided with screw threads 62 for the reception of a threaded cylindrical adjusting member 64 which is larger than and concentrically mounted with respect to the sleeve 16 and thus provides an annular space 66 between its inside surface and the outside surface of said sleeve. Adjusting member 64 is provided with an internal shoulder 68 which is in transverse alignment with the outer end of the sleeve 16 so that the outer race of a ball bearing 70 may bear against said shoulder and the inner race, which is mounted on the end of the shaft 12, may bear against the end of the said sleeve. The ball bearing 70 is adapted to take both a radial and a thrust load and has the inner race held in proper position by means of a flanged retaining ring 72 and the outer race held in proper position by means of a flanged retaining ring 74. Retaining ring 72 is threaded so that it may be screwed upon a threaded reduced end 76 of the printing cylinder shaft 12, and retaining ring 74 is removably held in proper position by means of screws 78. The flanges provided on the two cooperating retaining rings interfit so as to provide a suitable closure for the end of the apparatus. Thus, the annular space 66 may also receive a suitable lubricating medium both for the ball bearing 70 and the double roller bearing 18. If desired, any convenient packing medium may be inserted between the adjacent faces of the cooperating flanges of the retaining rings 72 and 74.

Adjusting member 64 is provided at the outside end thereof with an operating wheel 80 so that said member may be rotated to move it in and out of the threaded cylindrical retaining member 30 for effecting the desired adjustments inside register. Shaft 12 is held in operative position in the sleeve 16 by means of a nut 82 also threaded on the reduced end 76.

It will be noted that the sleeve 16 which encircles the printing cylinder shaft 12 extends from the end face of the printing cylinder 10 to the inside of the inner race of ball bearing 70 and, as mentioned above, is supported for rotation in the double roller bearing 18. Due to the provision of the roller bearing 70 and the flanged retaining rings 72 and 74, it will be apparent that, by turning the operating wheel 80, the adjusting member 64 may be moved into and out of the cylindrical member 30 and will carry with it the printing cylinder shaft 12. In this way, said shaft may be moved any desired limited distance, as governed by the length of the adjusting member 64 and the cylindrical member 30, for making corrections in side register of the printing cylinder 10. However, because of the bearing construction, said adjusting member 64 will not be rotated during rotation of the shaft 12. If desired, the adjusting member 64 may be locked in any adjusted position by means of a suitable set screws 84.

From the foregoing description, it will be understood that by removing the nut 82 and turning the bearing housing to the position shown in dot and dash lines in Fig. 1, said bearing housing may be readily removed from the frame. Such removal of the housing does not require the detachment of any of the parts associated with the side register adjusting means. In fact, said parts may remain in their adjusted positions while the bearing housing is removed so that in most cases they will not require readjustment when the housing is replaced in operative position.

Various changes may be made in the construction herein described and certain features thereof may be employed without others without departing from my invention or sacrificing any of its advantages.

What I claim is:

1. A rotary printing press comprising a side frame having an opening therein, a bearing housing removably mounted in said opening and adapted to receive and support a printing cylinder shaft, and means carried by said housing

for axially moving said printing cylinder shaft.

2. A rotary printing press comprising a side frame having a cylindrical opening therein, a cylindrical bearing housing removably mounted in said opening and adapted to receive and support a printing cylinder shaft, and means carried by said housing and removable therewith for axially moving said printing cylinder shaft.

3. A rotary printing press comprising a side frame having a tapered opening therein through which a printing cylinder may be removed, a tapered housing mounted in said opening, means for removably holding said housing in said opening, bearing means mounted in said housing, a sleeve rotatably supported in said bearing means and adapted to receive and support the shaft of the printing cylinder, a cylindrical adjusting member operatively and rotatably connected to said sleeve and concentrically mounted in said housing with respect to said sleeve, and means for locking the shaft in said sleeve.

4. A rotary printing press comprisnig a side frame having a tapered opening therein through which a printing cylinder may be removed, a tapered housing mounted in said opening, means for removably holding said housing in said opening, bearing means mounted in said housing, a sleeve rotatably supported in said bearing means and adapted to receive and support the shaft of the printing cylinder, means for locking the shaft in said sleeve, and an adjusting member threaded in said housing and operatively connected to said sleeve so that it will carry said sleeve and shaft as it is moved into and out of said housing.

5. A removable bearing holder for a rotary printing press comprising a cylindrical housing member adapted to fit into a cylindrical opening in the printing press frame, bearing means mounted in said housing, a sleeve rotatably supported in said bearing means and adapted to receive and support a cylinder shaft of the printing press, and an adjusting member mounted in said housing and operatively connected to said sleeve.

6. A rotary printing press comprising a side frame having an opening therein, a bearing housing removably mounted in said opening and adapted to receive and support a printing cylinder shaft, and means embodied in and forming a removable unit with said bearing housing for axially adjusting said printing cylinder shaft.

7. The rotary printing press of claim 6 in which said bearing housing comprises a housing member adapted to be removably fixed to said frame, a shaft member adapted to be removably fixed to said shaft, the said shaft member being axially adjustable in said housing member, and in which said means is operative for axially adjusting the shaft member in the housing member.

8. The rotary printing press of claim 6 in which said bearing housing comprises a housing member adapted to be removably fixed to said frame, a shaft member adapted to be removably fixed to said shaft, the said shaft member being rotatably mounted within and being also axially adjustable in said housing member, and in which said means is operative for axially adjusting the shaft member in the housing member.

9. The rotary printing press of claim 6 in which said bearing housing comprises a housing member adapted to be removably fixed to said frame, a shaft member adapted to be removably fixed to said shaft, the said shaft member being mounted on frictionless bearings for free rotation within the housing member, and said shaft member being also axially adjustable in said housing member, and in which said means is operative for axially adjusting the shaft member in the housing member.

ADOLPH WEISS.