June 19, 1956 P. H. DIETRICH ET AL 2,750,883

ADJUSTABLE MOUNTING FOR PRINTING PRESS ROLLS

Filed March 23, 1953 2 Sheets-Sheet 1

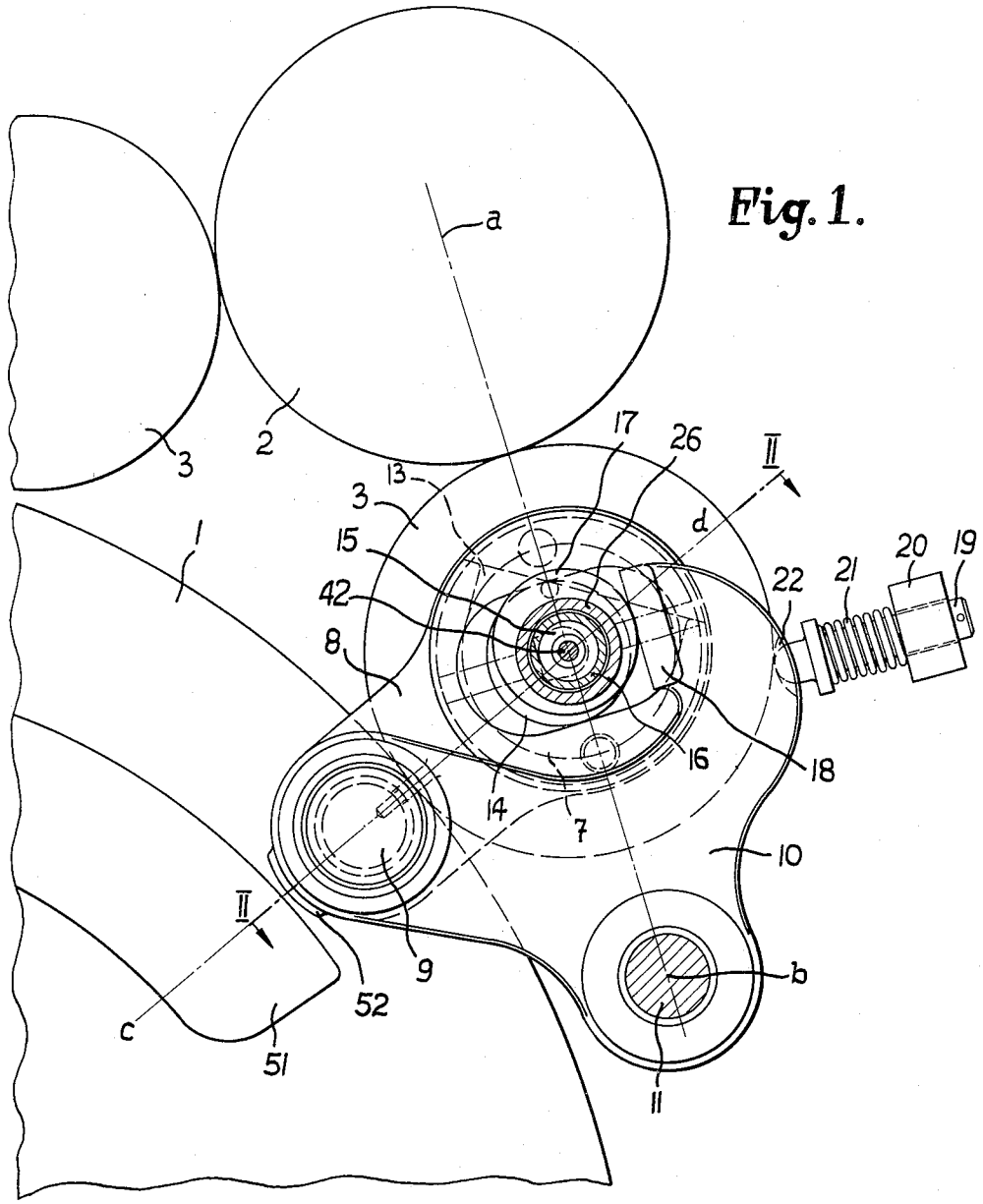


Fig. 1.

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Fig. 2.

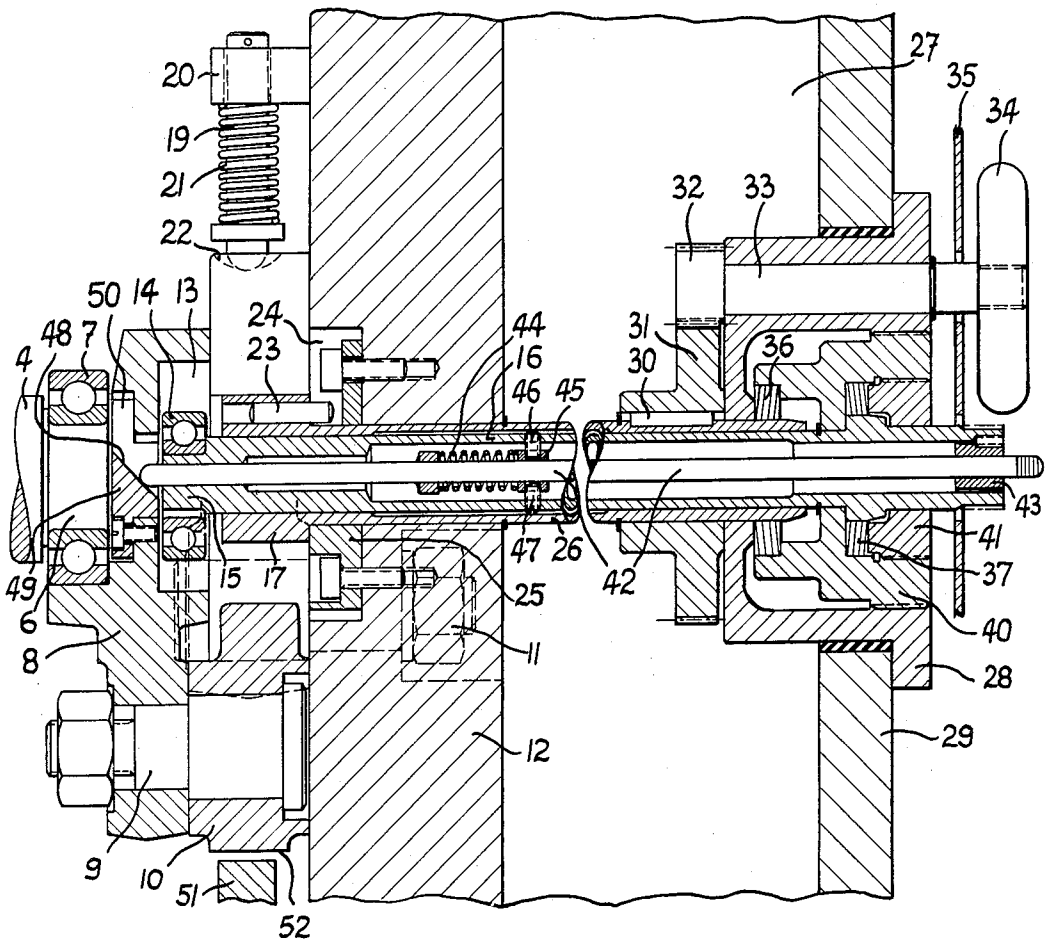
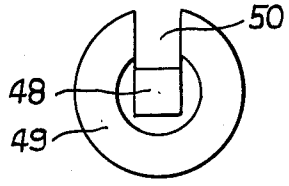


Fig. 3.



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ADJUSTABLE MOUNTING FOR PRINTING PRESS ROLLS

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8 Claims. (Cl. 101—348)

This invention relates to an adjustable mounting for printing press rolls and more particularly to means for mounting ink and moisture applying rolls for pressure adjustment with respect to other adjacent printing press rolls.

In printing presses of the character described it may be desired to have an inking roll, for example, mounted for frictional engagement with an adjacent driven roll of the press and, at the same time, arranged to contact the printing press plate cylinder with a predetermined pressure. If it is desired that the contact pressures between the inking roll and the friction roll as well as between the inking roll and the plate cylinder be separately adjustable the rolls may be mounted so that an alteration in one such contact pressure can be effected without change in the other such contact pressure.

According to this invention, such an arrangement is provided whereby an inking roll is adjustably mounted in a pivoted bracket effecting pressure adjustment against a friction roll while such pivoted bracket is itself mounted to provide separate adjustment of the contact pressure between the inking roll and the plate cylinder without alteration of the pressure between the inking roll and the friction roll. Also this invention provides adjusting means for such contact pressures coaxially mounted through the printing press frame by means of a stationary oil-tight bearing whereby adjustment and control of the various contact pressures may be effected from the outside of the press.

It is accordingly a principal object of this invention to provide a device for controlling contact pressures at two nips of an inking roll by means of coaxial adjusting mechanism accessible from the outside of the printing press.

Another object of this invention is to provide mechanism for mounting an inking roll in a printing press for adjustable displacement in two directions and for controlling and adjusting such displacement by means of coaxial control members mounted through the press frame.

A further object of this invention is to provide apparatus for effecting adjustment and control of printing press ink roll displacements separately with respect to at least two other rolls by means of coaxial adjusting members penetrating the printing press side frame through a single oil-tight sealed bushing therein.

A still further object of this invention is to provide mechanism for maintaining a predetermined contact pressure relationship between a printing press ink roll and plate cylinder notwithstanding subsequent alterations of contact pressure between the ink roll and another roll in the printing press.

Still another object of this invention is to provide means on the outside of the printing press for adjusting, controlling, and determining the contact pressure relationship between an ink roll and plate cylinder both of which are on the inside of the printing press.

Another object of this invention is to provide apparatus of the character described for controlling and adjusting

printing press roll pressures at a plurality of nips by means of mechanism which penetrates the printing press frame and an oil-tight gear box outside thereof at only one stationary oil-tight point.

A still further object of this invention is to provide an adjustable mounting for printing press ink rolls providing for displacement of the roll axis in at least two directions each of which is independently controllable by stationary coaxially mounted control members the axes of which remain fixed notwithstanding displacement of the inking roll axis.

Other objects and advantages of this invention will be apparent from the following description, the accompanying drawings and the appended claims.

In the drawing,

Fig. 1 is a side view of a roll mounting embodying this invention;

Fig. 2 is an axial section through a mounting and control mechanism embodying this invention on the line II—II of Fig. 1; and

Fig. 3 is an end view of a pressure feeler disk forming a part of the control device of the embodiment shown.

Referring to the drawings, which illustrate a preferred embodiment of this invention and in which like reference numerals refer to like parts throughout the several views, a printing press plate cylinder is indicated at **1**, while **2** indicates a friction roll in pressure contact with which are two inking or moisture coating rolls indicated at **3**. The rolls **3** are of known construction including a core **4** over which is provided a resilient coating of rubber and the like. The end of the roll axle **6** is carried by a bearing member **7** supported in a forked bearing bracket **8**. The bearing bracket **8** is pivotally mounted by a bolt **9** to a swivel plate **10**. Swivel plate **10** is pivotally mounted on the inside of the printing press side frame **12** by means of the bolt **11**.

The side face of bearing bracket **8** adjacent swivel plate **10** has an elongated slot **13** forming a race for bearing **14** which is mounted on eccentric cam **15** at one end of a hollow control shaft **16**. Rotation of eccentric cam **15**, by means of control shaft **16**, effects, through bearing **14** in race **13**, pivotal movement of bearing bracket **8** about bolt **9**. Such displacement of bearing bracket **8** moves roll **3** with respect to fixed roll **2** providing adjustment of the pressure contact therebetween. The axis of control shaft **16** lies on a line *c*—*d* through bolt **9** to the axis of the plate cylinder **1** and on a line *a*—*b* connecting the axis of friction **2** with bolt **11**. Accordingly alterations in pressure between rolls **2** and **3** effected by adjustment of eccentric cam **15** take place without alteration in the pressure contact between roll **3** and plate cylinder **1**.

A hollow control shaft **26** is provided coaxially around control shaft **16**. This shaft **26** carries at the inner end thereof eccentric cam **17** which engages a stop **18** on swivel plate **10**. A pressure member **19** is mounted by bracket **20** on the inside of the press side frame **12**. One end of pressure member **19** is urged into a hollow **22** in swivel plate **10** by a spring **21**. This pressure member constantly urges swivel plate **10** to pivot about bolt **11** toward plate cylinder **1** (i. e., counterclockwise in Fig. 1) to the extent that such pivoting is permitted by the abutment of stop **18** against eccentric cam **17**. Thus rotation of eccentric cam **17**, by means of control shaft **26**, causes, by engagement with stop **18**, pivoting of swivel plate **10** about the bolt **11**. This movement of swivel plate **10** displaces bearing bracket **8** with respect to plate cylinder **1** and, accordingly, alters the pressure contact between roll **3** and plate cylinder **1**. The extent of rotation of eccentric cam **17** is limited by a pin **23** which projects into slot **24** of bushing **25** mounted on the printing press frame **12**. Since control shaft **26** is mounted coaxially about control shaft **16**, its axis also lies at the

intersection of lines *a*—*b* and *c*—*d*, as above noted, effecting adjustment between plate cylinder 1 and inking roll 3 without alteration of the existing adjustment between roll 3 and roll 2.

Coaxial control shafts 16 and 26 are led through the side frame 12 of the printing press at bushing 25, through an enclosed gear box 27 mounted on the outside of the press frame 12, and into a flanged bushing 28 inserted in the covering 29 of the gear box 27. The gear box 27 includes the main drive gear components for the various members of the printing press, although they have been omitted from the drawing for clarity. The gear box is preferably made oil-tight for sealed in drive lubrication of the main gear train and printing press drive components.

A gear 31 is mounted on control shaft 26 and keyed thereto at 30. Gear 31 meshes with pinion 32 on shaft 33 which also penetrates the flanged bushing 28 to the outside of the printing press casing 35. Shaft 33 is provided with a handwheel 34 on the outside of the press by which shaft 26 and its eccentric cam 17 can be rotated through the interaction of shaft 33 and gears 31 and 32.

Control shaft 16, mounted coaxially within control shaft 26, is led to the outside of the press through bushings 40 and 41 in flanged bushing 28. The outer end of control shaft 16 is flattened to receive a key or handwheel by means of which shaft 16 may be rotated effecting rotation of eccentric cam 15 and, by means of bearing 14 and race 13 in pivoted bearing bracket 8, displacement and adjustment of roll 3 with respect to roll 2.

In order to prevent rotation of control shafts 16 and 26 after they are set to a desired adjustment, braking means 36 and 37 are provided. These braking mechanisms are of known construction and comprise conical sheet metal disks which are pressed axially together to exert a radial pressure on shafts 26 and 16 respectively, to an extent which prevents unintentional rotation of the shaft but permits manually rotating the shafts by the operator. The threaded bushings 40 and 41 maintain axial pressure on the braking means 36 and 37 and permit adjustment thereof.

Coaxially within control shaft 16 is provided a feeler rod 42 supported at the inner end by a boring through eccentric cam 15 and, at the outer end, by packing 43. Feeler rod 42 is free to move axially through shaft 16, although it is urged inwardly (i. e., to the left in Fig. 2) by means of a spring 44 acting against a ring 45 affixed to the inside of hollow control shaft 16 by screws 46 and 47. As so urged by spring 44, feeler rod 42 bears against the oblique surface 48 of a slit 50 milled into feeler disk 49 mounted in bearing bracket 8 adjacent the bearing 7 of roll 3. This feeler rod has for its purpose the transmission to the outside of the press casing 35 of vibrations of inking roll 3 as it bears against the type on plate cylinder 1.

Thus, for a given degree of pressure contact between roll 3 and cylinder 1, the axis of roll 3 will be displaced as the resilient covering on roll 3 encounters variations in height of the printing plates affixed to plate cylinder 1; for example, as roll 3 encounters alternate gaps between adjacent printing plates and areas of solid type on the plate during rotation of cylinder 1. Such displacement of roll 3 will cause concomitant movement of swivel plate 10 with respect to feeler rod 42, and, since rod 42 is being urged against inclined surface 48 by spring 44, such movement of the axis of roll 3 will be reproduced on the outside of the printing press in terms of axial reciprocation of rod 42. By placing his finger against the exposed outer end of rod 42, accordingly, the printing press operator can judge of the extent and/or frequency of such displacements of roll 3 and thereby adjust the pressure contact of roll 3 against cylinder 1 as necessary or desired for proper operation.

Complete disengagement of the roll 3 is accomplished by an adjustable cam 51 which, upon being moved in a direction radially outwardly of plate cylinder 1, engages stop 52 on swivel plate 10 and lifts roll 3 completely free of plate cylinder 1. If there are a plurality of inking rolls 3 around a portion of the periphery of plate cylinder 1, they may simultaneously be lifted from the plate cylinder by a plurality of simultaneously moving cams 51. It will also be understood that a similar mounting and adjusting device is provided for the opposite end of roll 3, and, if the printing press includes a plurality of inking cylinders 3 such mounting and adjusting devices are provided for each inking cylinder.

Accordingly apparatus is provided which permits separate and independent adjustment and displacement of the axis of inking roll 3 in two directions, each such adjustment being accomplished in one direction without alteration of the pressure contact in the other direction. Furthermore this apparatus dispenses with large openings in the side frames, and permits, by its coaxial arrangement of feeler rods, the penetration in oil-tight fashion of a sealed-in gear box thereby providing on the outside of the printing press adjusting and control means for the maintenance, adjustment, and control of desired pressures between adjacent rolls on the inside of the printing press. It will also be understood that such engagement of the rolls and adjustment and control thereof may be performed by the operator according to the present invention from the outside of the press without stopping the press and without interruption in the printing operations.

While the forms of apparatus herein described constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to these precise forms of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. In a printing press of the character described having a plate cylinder, an inking roll and a friction roll, the combination which comprises a bearing bracket for supporting said inking roll, a swivel plate for supporting said bearing bracket, first pivot means for mounting said swivel plate on said press, second pivot means for mounting said bearing bracket on said swivel plate, first cam means for pivoting said swivel plate about said first pivot means, second cam means for pivoting said bearing bracket about said second pivot means, a control shaft for adjusting each said cam means, means for mounting said shafts in coaxial arrangement in said press, control means outside said press for rotating said shafts effecting adjustment of said cam means, and feeler means for tangibly transmitting vibrations of said inking roll to the outside of said press.

2. In a printing press of the character described having a plate cylinder, an inking roll adapted for oscillating toward and away from said plate cylinder and a friction roll adapted for substantially constant pressure contact with said inking roll withstanding said oscillations thereof, the combination which comprises a bearing bracket for supporting said inking roll, a swivel plate for supporting said bearing bracket, first pivot means for mounting said swivel plate on said press for free swiveling movement with respect to said plate cylinder, second pivot means for mounting said bearing bracket on said swivel plate, first cam means for pivoting said swivel plate about said first pivot means in one direction, spring means urging pivoting of said swivel plate about said first pivot means in the opposite direction, said first cam means and said spring means effecting adjustment of pressure between said inking roll and said plate cylinder, second cam means for pivoting said bearing bracket about said second pivot means effecting adjustment of pressure between said inking roll and said friction roll, means for mounting both said cam means in coaxial arrangement, a control shaft for adjusting each said cam means, means for mounting said control shafts in coaxial arrangement in said press, and control means out-

side said press for rotating said shafts effecting adjustment of said cam means, the common axis of said shafts intersecting a line connecting the axis of said friction roll with said first pivot means at the point of intersection of said line with a line through said second pivot means connecting said common axis with the axis of said plate cylinder whereby said common axis of said shafts remains stationary notwithstanding said relative oscillating and pivoting movements of said bearing bracket, swivel plate, and inking roll.

3. In a printing press of the character described having a plate cylinder, an inking roll adapted for oscillating movement toward and away from said plate cylinder and a friction roll adapted for constant pressure contact with said inking roll notwithstanding said oscillations thereof, the combination which comprises a bearing bracket for supporting said inking roll, a swivel plate for supporting said bearing bracket, first pivot means for mounting said swivel plate on said press for free swiveling movement with respect to said plate cylinder, second pivot means for mounting said bearing bracket on said swivel plate, first cam means for pivoting said swivel plate about said first pivot means in one direction with respect to said plate cylinder, spring means for urging said swivel plate the opposite direction against the action of said first cam means, second cam means for pivoting said bearing bracket about said second pivot means, means for mounting both said cam means in coaxial arrangement, a control shaft for adjusting each said cam means, means for mounting said control shafts in coaxial arrangement in said press for maintaining the common axis of said shafts stationary notwithstanding said oscillating and pivoting movements of said swivel plate and said bearing bracket, control means outside said press for adjusting said cam means through said shafts, and braking means for maintaining said shafts in the angular position imparted thereto by said control means.

4. In a printing press of the character described having an inking roll pivotally mounted for adjustment in two directions and a gear box on the outside of said press, the combination which comprises a rotary cam means for adjusting said inking roll in each of said directions, a control shaft for rotating each said cam means, means for mounting said shafts in concentric arrangement through said gear box, means for maintaining an oil-tight joint where said shafts enter said gear box, control means outside said gear box for rotating said shafts to effect adjustment of said cam means, a feeler rod for indicating on the outside of said press pivoting movements of said inking roll, means for mounting said feeler rod within said concentric control shafts for axial movement therein, and means engaging said feeler rod and said inking roll for transmitting to said rod said pivoting movements of said roll.

5. In a printing press of the character described having a plate cylinder, an inking roll, a friction roll, and a gear box on the outside of said press, the combination which comprises a bearing bracket for supporting said inking roll, a swivel plate for supporting said bearing bracket, first pivot means for mounting said swivel plate on said press, second pivot means for mounting said bearing bracket on said swivel plate, first rotating cam means for pivoting said swivel plate about said first pivot means, spring means for urging said swivel plate against said first cam means, second rotating cam means for pivoting said bearing bracket about said second pivot means, a hollow control shaft for adjusting each said cam means, means for mounting said shafts in concentric arrangement in said press through said gear box, means for maintaining an oil-tight joint where said shafts enter said gear box, manual control means outside said gear box for rotating said shafts to effect adjustment of said cam means, braking means for maintaining said shafts in the angular position imparted thereto by said control means, a feeler rod for tangibly transmitting pivoting movements of said inking roll to the outside of said press, means for mounting said feeler rod within said concentric control shafts for axial movement therein, and means engaging said feeler rod and said inking roll for transmitting to said rod pivoting movements of said roll, the common axis of said shafts and said rod intersecting a line connecting the axis of said friction roll with said first pivot means at the point of intersection of said line with a line through said second pivot means connecting said common axis with the axis of said plate cylinder.

6. In a printing press of the character described having a plate cylinder, an inking roll adapted for oscillating movement toward and away from said plate cylinder and a friction roll adapted for constant pressure contact with said inking roll notwithstanding said oscillating movements thereof, the combination which comprises a bearing bracket for supporting said inking roll, a swivel plate for supporting said bearing bracket, first pivot means for mounting said swivel plate on said press for swiveling movement toward and away from said plate cylinder, second pivot means for mounting said bearing bracket on said swivel plate for pivotal movement toward and away from said friction roll, first cam means for pivoting said swivel plate about said first pivot means in one direction with respect to said plate cylinder, spring means for urging said swivel plate against the action of said first cam means, said first cam means and said spring means effecting adjustment of pressure contact between said inking roll and said plate cylinder, second cam means for pivoting said bearing bracket about said second pivot means effecting adjustment of pressure contact between said inking roll and said friction roll, means for mounting both said cam means in coaxial arrangement, a control shaft for adjusting each said cam means, means for mounting said control shafts in coaxial arrangement in said press with the common axis of said control shafts stationary notwithstanding said oscillating and pivoting movements, control means outside said press for adjusting said cam means through said shafts, and braking means for maintaining said shafts in the angular position imparted thereto by said control means.

7. In a printing press of the character described having an inking roll pivotally mounted for movement in two directions, the combination which comprises a rotary cam means for imparting to said roll pivoting adjusting movement in each said direction, a control shaft for rotating each said cam means, means for mounting said shafts in concentric arrangement in said press, a feeler rod for indicating on the outside of said press said pivoting movements of said inking roll, means for mounting said feeler rod within said concentric control shaft for axial movement therein, and means engaging said feeler rod and said inking roll for transmitting to said rod said pivot movements of said roll.

8. In a printing press of the character described having a plate cylinder, a friction roll and an inking roll mounting pivoted at a first point for movement with respect to said plate cylinder and at a second point for movement with respect to said friction roll, the combination which comprises rotary cam means for imparting to said inking roll mounting pivoting adjusting movement separately about each of said pivot points, a control shaft for rotating each said cam means, means for mounting said cam means in coaxial arrangement, means for mounting said control shafts in concentric arrangement, indicating means for tangibly transmitting said pivotal movement of said inking roll to the outside of said press, means for mounting said indicating means within said concentric control shafts, the common axis of said control shafts

interconnecting a line connecting the axis of said friction roll with said first pivot point at the point of intersection of said line with a line through said pivot point connecting said common axis with the axis of said plate cylinder.

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