April 16, 1957 A. R. STOBB 2,788,741

PRINTING PRESS ACCESSORY

Filed Dec. 2, 1953 2 Sheets-Sheet 1

Fig. 1.

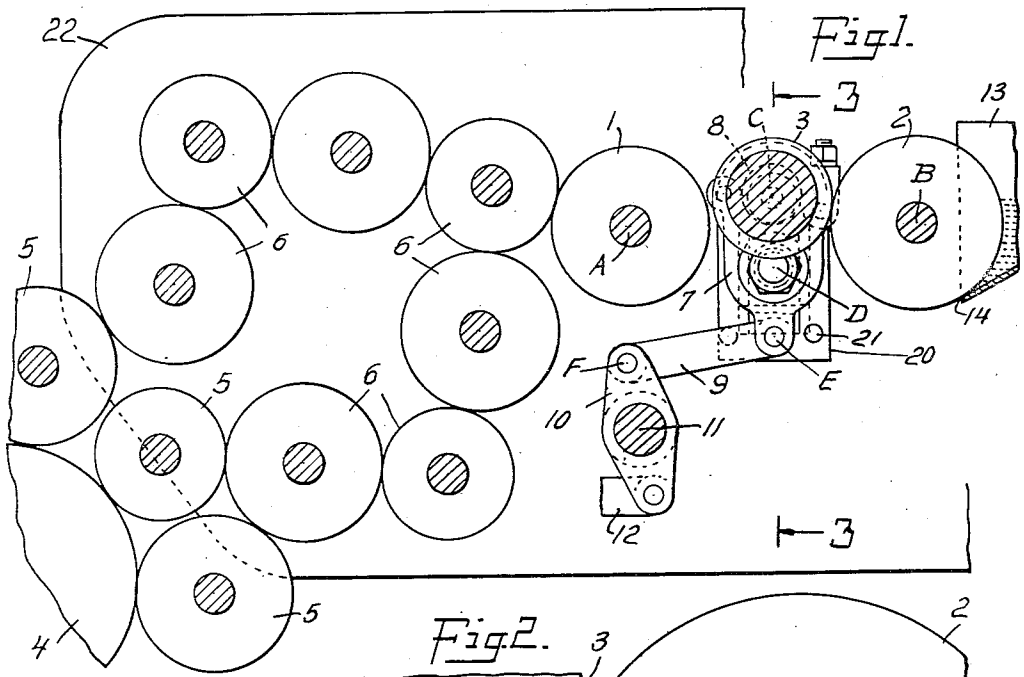


Fig. 2.

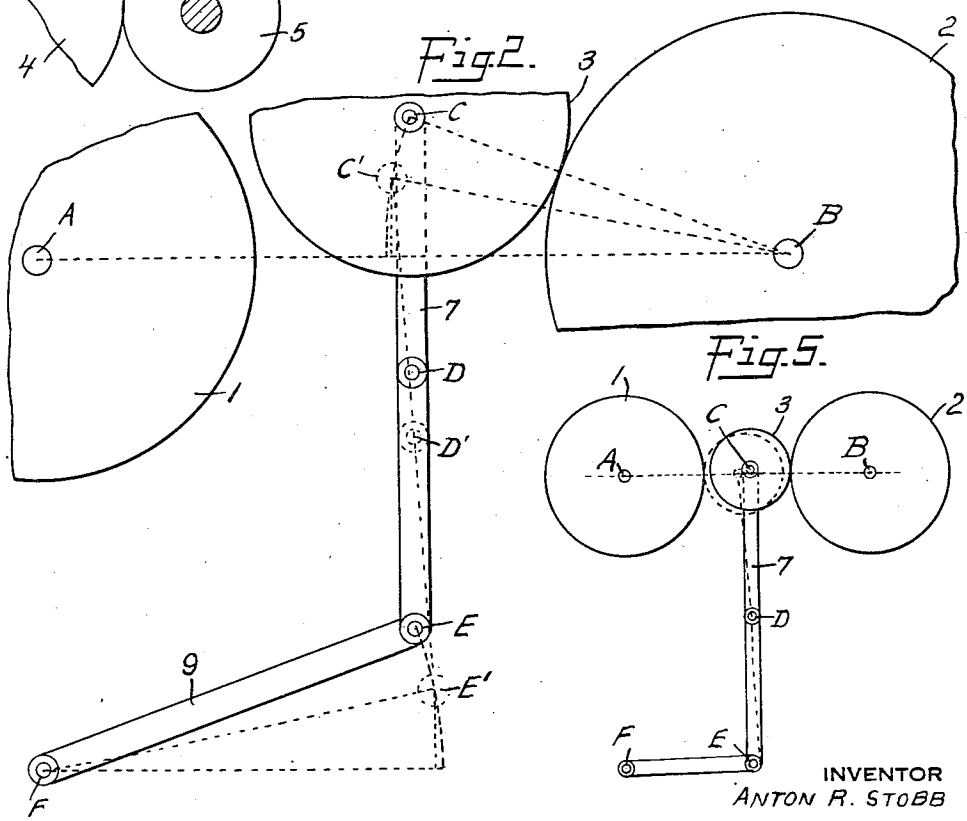


Fig. 5.

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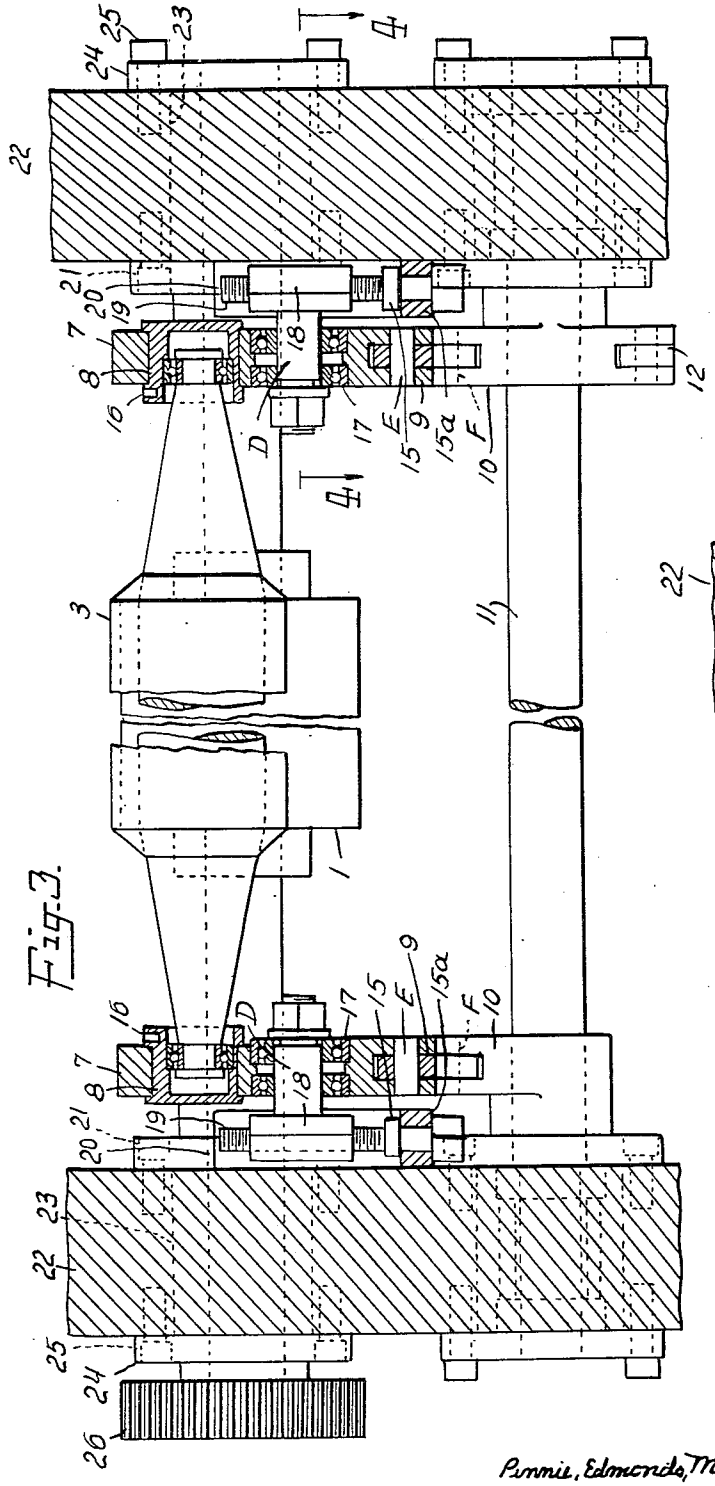


Fig. 3.

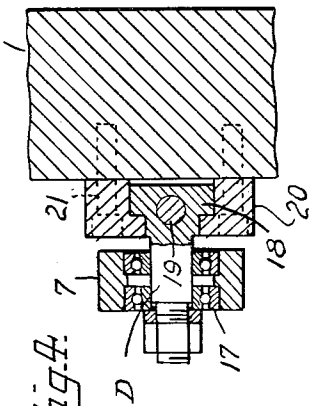


Fig. 4.

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PRINTING PRESS ACCESSORY

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Application December 2, 1953, Serial No. 395,818

3 Claims. (Cl. 101—350)

This invention relates to rotary printing presses of the type in which printing ink is conveyed from a fountain roller to an ink transfer or distributing roller by means of an oscillating roller, known as a ductor or ductor roller. More particularly, the invention provides improved method and means for supporting and oscillating the ductor and for independently adjusting the contact between the ductor and the fountain roller and ink distributing roller, respectively.

In rotary presses of the type just noted, printing ink is applied to the periphery of the fountain roller by any suitable means, for instance, by means of an ink fountain equipped with conventional doctor blades for regulating and adjusting the thickness of the film of ink on the fountain roller. As is well understood in the art, this film of ink is picked up by the ductor while the latter is rotating in contact with the fountain roller and the ductor is then moved out of contact with the fountain roller and into contact with the first of a train of ink transfer or distributing rollers and the ink film is applied to the latter.

The reason for this alternate contact between the ductor and the fountain roller and ink transfer roller, respectively, is that the latter rollers generally operate at different peripheral speeds and, therefore, it is necessary to avoid simultaneous contact between the ductor and the other two rollers.

Various mechanisms have been proposed for supporting and oscillating such ductor rollers. One previously proposed arrangement has been to mount the ductor on a pivotally supported bracket connected through conventional means with a cam mechanism, or the like, adapted to swing the bracket about its pivotal point and thus move the ductor into contact, alternately, with the fountain roller and the ink distributing roller.

In printing presses of the type described, it is necessary that contact between the ductor, which is usually rubber surfaced, and the other two rollers, which are usually of steel, be nicely adjusted in order to convey to the plate cylinder a uniform film of ink of predetermined thickness.

A difficulty heretofore experienced in the operation of rotary printing presses has been the tedious adjustment of the contacts between the respective rollers. A primary difficulty has been due to the fact that the adjustment between the ductor and the fountain roller, for instance, has been disturbed by the subsequent adjustment between the ductor and the ink transfer roller.

It is an object of my present invention to provide an inking mechanism whereby adjustment of the contact between the ductor roller and the fountain roller and ink transfer roller, respectively, can be readily and accurately made and whereby adjustment with respect to one of the rollers, e. g., the fountain roller, is not disturbed by subsequent adjustment with respect to the ink distributing roller.

These and other advantages are accomplished in accordance with my present invention, as will appear from the following description thereof, by so positioning the fountain roller and the ink distributing roller that the shortest distance between their peripheries is somewhat less than the sum of the amplitude of the oscillation of the ductor and the diameter of the ductor, mounting the ductor between the fountain roller and the ink distributing roller on an axis somewhat to one side of the plane extending through the axes of the fountain roller and distributing roller, as hereinafter more fully described, on a pivotally supported bracket adapted to be oscillated about the pivotal point to move the ductor alternately into the vicinity of the fountain roller, at the ink pickup end of the oscillation, and into the vicinity of the distributing roller, at the ink discharge end of the oscillation, adjusting the position of the axis of the ductor with respect to the supporting bracket to make the desired contact between the ductor and the fountain roller, at the ink pick-up end of the oscillation, and swinging the axis of the ductor in an arc concentric with the axis of the fountain roller to establish the desired contact between the ductor and the ink distributing roller at the ink discharge end of the oscillation. By reason of the fact that the ductor is swung in an arc concentric with the axis of the fountain roller in making the second adjustment, the previously made adjustment between the ductor and the fountain roller is undisturbed by the second adjustment. And by reason of the positioning of the fountain roller and the distributing roller and the positioning of the axis of the ductor with respect thereto, the ductor will move closer to, or away from, the distributing roller as it is moved along such arc.

The movement of the axis of the ductor with respect to the supporting bracket in adjusting the contact between the fountain roller and the ink distributing roller can be effected by any suitable means, for instance, by mounting the axis of the ductor in eccentric bearings which can be rotated to effect the desired movement of the axis of the ductor with respect to the supporting bracket.

The method of, and means for, adjusting the contact between the ductor and the ink distributing roller without disturbing the adjustment between the ductor and the fountain roller will be further described and illustrated with reference to the accompanying drawings which represent a particularly advantageous embodiment of the invention and of which:

Figure 1 is a conventional and somewhat fragmentary, sectional view of a rotary printing press embodying the invention;

Figure 2 is a diagrammatic sectional view of the ductor support and actuating mechanism, somewhat enlarged for clarity;

Figure 3 is a fragmentary sectional view along the line 3—3 of Figure 1;

Figure 4 is a fragmentary sectional view along the line 4—4 of Figure 3, and

Figure 5 is a further diagrammatic illustration of the necessity of positioning the respective rollers, as heretofore described.

As shown more clearly in Figures 1 and 2, the inking mechanism comprises an ink transfer roller 1, rotatably mounted on axis A, a fountain roller 2, rotatably mounted on axis B, a ductor 3, rotatably mounted on axis C, a plate cylinder 4, form rollers 5 and a series of intermediate ink distributing rollers 6.

The ductor 3 is supported at the upper end of supporting bracket 7, the shaft C of the ductor being mounted at each end in eccentric bearings 8. The bracket 7 is pivotally mounted at its mid-point on shaft D and is connected at its lower end by means of shaft E with a me-

chanical link 9, the other end of the link 9 being connected by means of shaft F with crank 10 mounted on shaft 11. Crank 10 is caused to swing back and forth about its axis by means of cam, or other conventional mechanism which, for instance, may be mechanically connected to the crank by the link 12.

In operation, ink is supplied to the fountain roller as by means of ink fountain 13, the thickness of the ink film carried from the fountain being controlled by doctor blades indicated at 14. By adjustment means, subsequently described, the ductor is caused to make a nice contact with the fountain roller 2 when the shaft F of crank 10 is at its extreme left position and to make contact with the ink transfer roller 1 when the shaft F had been moved to the extreme position to the right, it being understood that the ductor is at no time in contact with more than one of the other rollers.

The invention resides primarily in the novel combination, arrangement, positioning and proportioning of the respective elements whereby adjustment of contact between the respective rollers can be readily and accurately made and whereby adjustment between the ductor roller and the fountain roller 2 can be accurately made and will not be disturbed by subsequent adjustment of contact between the ductor roller and the ink transfer roller 1.

The geometric principle involved in this construction is best illustrated by Figure 2 of the drawing which is diagrammatic and has been simplified for clarity. The pivotal points D of the supporting brackets 7 are so positioned as to lie in a plane perpendicular to the plane extending through the axes A and B, and intersecting plane AB intermediate the circumferences of rollers 1 and 2. The various elements are so proportioned, constructed and arranged that, when the ductor has been moved to its extreme position to the right, the center line of the supporting brackets 7 is perpendicular to line AB. The axis of ductor 3 is positioned somewhat above the line AB, as hereinafter more fully described, and the distance between the peripheries of rollers 1 and 2 is somewhat less than the amplitude of the ductor oscillation, plus the diameter of the ductor and, therefore, by raising or lowering the ductor along an arc concentric with axis B, the distance between the periphery of roller 3 and that of roller 1 may be increased or decreased. As subsequently described, and as shown more clearly in Figures 3 and 4, the pivotal points D of brackets 7 may be raised or lowered to effect the raising or lowering of the ductor. The amplitude of the oscillation of the ductor is constant.

The mechanical link 9 is chosen of such length that the distance EF is equal to the distance BC when the bracket 7 is perpendicular to line AB, i. e., at the ink pick-up end of the oscillation, and the point F is so positioned, as shown more clearly in Figure 2 of the drawings, that the angle CBA is equal to the angle between the center line FE of the link and a plane drawn through point F parallel to plane AB. Therefore, since the arms of bracket 7 are of equal length and the distance EF is fixed, the distance BC will remain unchanged when the points D are raised or lowered along the plane perpendicular to AB. For instance, if the point D be lowered to D', the point C will move to C', and the point E will move to E'. The distance E'F must remain the same as the distance EF because it is fixed by the link 9 and, consequently, the distance B—C' will remain unchanged, in accordance with recognized geometric principles. Therefore, having made the adjustment between rollers 2 and 3 and thus fixed the distance B—C, as equal to the sum of the radii of those rollers, adjustment between rollers 1 and 3 may subsequently be made by raising or lowering the pivotal points D without disturbing the first adjustment, since the distance B—C will remain unchanged, and the ductor will be caused to swing in an arc about the axis B.

As previously noted, the adjustment between rollers 2 and 3, in the apparatus shown, will be made with the ductor at the extreme ink pick-up end of the oscillation, which results in bracket 7 being perpendicular to line A—B. This adjustment is, with advantage, made by mounting each end of shaft C in an eccentric bearing 8, of conventional type, provided with a pinhole 16 by which the bearing may be rotated.

Shaft D is provided with a conventional bearing 17 and is attached to or is made as an integral part of block 18 which is internally threaded to receive adjustment screw 19 provided with a collar 15 by which the block 18 and the pivotal shaft D may be raised or lowered, the collar 15 bearing on lug 15*a*.

In the construction shown in Figures 3 and 4, the block 18 is shown as supported by brackets 20 secured by machine bolts 21 to the side frames 22 of the press. In usual construction, the rollers 1, 2, 4, 5, and 6 will be mounted on shafts, also supported by side frames 22 and by means of bearings 23 secured to the frames by plates 24 and machine screws 25. Roller 1 may be rotated by means of driving gear 26 attached to shaft A. As is understood in the art, the ductor is usually not separately driven and the other rollers may be caused to rotate in accordance with conventional practice.

In the embodiment of the invention shown in the drawings, it is necessary, as previously noted herein, that the axis C of the ductor be somewhat removed from the plane represented by line A—B. The reason for this is to avoid having the ductor make contact with the distributing roller, at the ink discharge end of the oscillation, at a point such that the contact between the two rollers could not be adjusted, as heretofore described. The necessity of avoiding such condition, is illustrated by Figure 5 of the drawings, which shows the ductor in each of the extreme positions of its oscillatory movement and making contact with the distributing roller at the intersection of its circumference with the line A—B. It will be apparent from the diagram of Figure 5 that with such arrangement neither a raising nor a lowering of the pivotal point D will bring the ductor into closer contact with roller 1 at the ink discharge end of the oscillation. Figure 5 also illustrates the necessity for having the peripheries of rollers 1 and 2 spaced apart a distance somewhat less than the diameter of the ductor plus the amplitude of its oscillation.

Reference herein and in the appended claims to positioning the axis of the ductor somewhat to one side of the plane passing through the axes of the other two rollers will be understood to mean a distance such as to avoid the condition illustrated by Figure 5 of the drawings. Further reference herein and in the appended claims to the spacing of the fountain roller from the ink distributing roller so that the distance between their peripheries is somewhat less than the sum of the amplitude of the oscillation of the ductor plus the diameter of the ductor will be understood to mean a difference sufficiently great to permit contact between the ductor and the other two rollers, respectively, at the extreme limits of the oscillation, while avoiding the condition represented by Figure 5 of the drawings.

In view of the foregoing disclosure, it will be appreciated that various modifications of the specific mechanism just described may be made within the scope of the present invention. For instance, various other types of adjustment means may be used for moving the axis of the ductor with respect to the supporting bracket in order to effect the nicety of contact between the ductor and the fountain roller. Also, other mechanical arrangements may be used for effecting the oscillation of the supporting bracket and for guiding the axis of the ductor along an arc concentric with the axis of the fountain roller as the pivotal support of the bracket is raised or lowered. Further, it will be recognized that, with minor changes in the construction shown, adjustment of the contact between the ductor and the ink distributing roller

may be made by shifting the position of shaft C with respect to the supporting bracket, with the ductor in the extreme ink discharge position, and thereafter adjusting contact between the ductor and the fountain roller by raising or lowering the pivotal support of the supporting bracket. It will be understood that such modifications are included within the scope of the present invention.

I claim:

1. Inking mechanism for a rotary printing press comprising a fountain roller, an ink distributing roller and a ductor roller, each rotatably mounted on parallel axes, the ductor roller being mounted at each end on one end of an arm of a supporting bracket pivotally supported at its center, the pivotal support for said bracket lying in a plane perpendicular to the plane passing through the axes of the fountain roller and ink-distributing roller, and intersecting that plane intermediate the circumferences of said rollers, actuating means connected to the second arm of the bracket for oscillating said bracket about its pivotal point with constant amplitude and thereby bringing the ductor roller alternately into the vicinity of the fountain roller, at the pick-up end of the oscillation, and into the vicinity of the distributing roller, at the ink-discharge end of the oscillation, the peripheries of the fountain roller and distributing rollers being spaced apart a distance somewhat less than the sum of the amplitude of the ductor oscillation and the diameter of the ductor and the axis of the ductor being somewhat to one side of the plane extending through the axes of the other two rollers, means for adjusting the position of the ductor relative to the supporting bracket, while the center line of said bracket lies in said perpendicular plane to obtain the desired contact between the ductor and the fountain roller at the pick-up end of the oscillation and means for adjusting the contact between the ductor and the distributing roller at the ink-discharge end of the oscillation without disturbing the first said adjustment, the last said means comprising adjustment means for raising and lowering the pivotal bracket support in the said perpendicular plane and means associated with said actuating means for causing the outer end of the second arm of the bracket to swing in an arc having a radius equal to the sum of the radii of the ductor and the fountain roller, and thereby causing the ductor roller to swing in a similar arc about the axis of the fountain roller, during said adjustment of the pivotal support.

2. Inking mechanism for a rotary printing press comprising a fountain roller, an ink distributing roller and a ductor roller, each rotatably mounted on parallel axes, the ductor roller being mounted at each end, on one end of an arm of a supporting bracket pivotally supported at its center, the pivotal support for said bracket lying in a plane perpendicular to the plane passing through the axes of the fountain roller and the ink-distributing roller and intersecting that plane intermediate the circumferences of said rollers, an actuating link connected to the second arm of the bracket and extending in a direction away from the fountain roller and perpendicular to said perpendicular plane, said link being of a length equal to the sum of the radii of the ductor roller and the fountain roller, means for actuating said link for swinging said bracket about its pivotal point with constant amplitude and thereby bringing the ductor roller alternately into the vicinity of the fountain roller, at the ink pick-up end of the stroke, and into the vicinity of the distributing roller at the ink-discharge end of the stroke, the peripheries of the fountain roller and distributing rollers being spaced apart a distance somewhat less than the sum of the amplitude of the ductor oscillation and the diameter of the ductor, the axis of the ductor being somewhat to one side of the plane extending through the axes of the other two rollers, means for adjusting the position of the ductor relative to the supporting bracket to obtain the desired contact between the ductor and the fountain roller at the ink pick-up end of the oscillation, said link and actuating means being so constructed and arranged that, at the ink pick-up end of the oscillation, the center line of the supporting bracket is perpendicular to the plane passing through the axes of the fountain roller and ink distributing roller and the far end of the link is so positioned that the angle between a plane passing therethrough parallel to the last said plane and the center line of the link is equal to the angle between a line drawn between the axes of the ductor roller and the fountain roller and the plane through the axes of the fountain roller and ink distributing roller, and means for adjusting the pivotal bracket support in the said perpendicular plane to bring the ductor into position to make appropriate contact with the distributing roller when at the opposite limit of the oscillation.

3. Inking mechanism for a rotary printing press comprising an ink distributing roller, rotatably mounted on a shaft A, a fountain roller, rotatably mounted on a shaft B, and a ductor roller, rotatably mounted on a shaft C, the ductor roller being adapted to be moved alternately in contact with the fountain roller and ink distributing roller, said mechanism being further characterized in that the ductor shaft C is supported at each end by one end of a supporting bracket pivotally mounted to swing about a shaft D and pivotally connected at its other end by shaft E with one end of an actuating link, actuating means connected by shaft F to the other end of said link and adapted to swing the ductor roller alternately into the vicinity of the fountain roller at the ink-pick-up end of the stroke and into the vicinity of the distributing roller at the ink-discharge end of the stroke, the axis of shaft D being midway between the axis of shafts C and E and lying within a plane perpendicular to a plane extending through the axes of shafts A and B, and intersecting that plane intermediate the circumferences of the fountain roller and ink-distributing roller, the peripheries of the fountain roller and distributing rollers being spaced apart a distance somewhat less than the sum of the amplitude of the ductor oscillation and the diameter of the ductor and the axis of the ductor being somewhat to one side of the plane extending through the axes of the other two rollers, the shaft C being mounted at each end in an eccentric bearing adapted to move the periphery of the ductor roller into contact with the periphery of the fountain roller at the ink pick-up end of the stroke, the said link and actuating means being so constructed and arranged that, at the ink pick-up end of the oscillation, the center line CE of the supporting bracket is perpendicular to the plane passing through the axes of shafts A and B and the axes of shaft F is positioned so that the angle between the plane passing therethrough parallel to the last said plane and a line drawn between the axes of shafts F and E is equal to the angle between a line drawn through the axes of shafts B and C and the plane through the axes of the shafts A and B, adjustment means for raising and lowering shaft D in said perpendicular plane to bring the periphery of the ductor roller into contact with that of the ink distributing roller at the ink-discharge end of the stroke and the distance between the axis of shaft F and the axis of shaft E being equal to the sum of the radii of the ductor roller and the fountain roller.

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