Sept. 23, 1958 E. W. WORTHINGTON 2,853,005

INK CONTROL DEVICE

Filed April 16, 1957 3 Sheets-Sheet 1

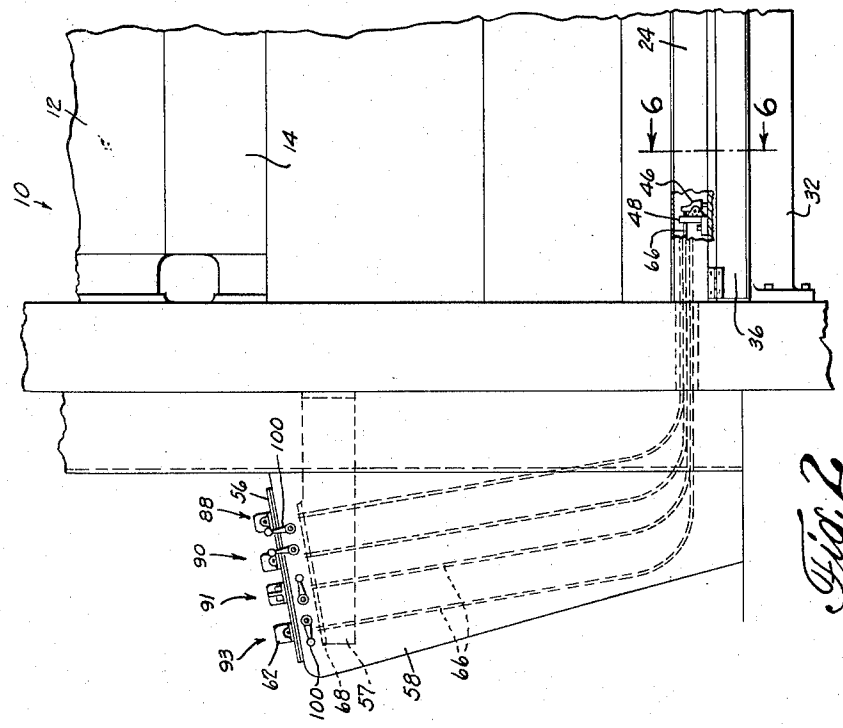


Fig. 2

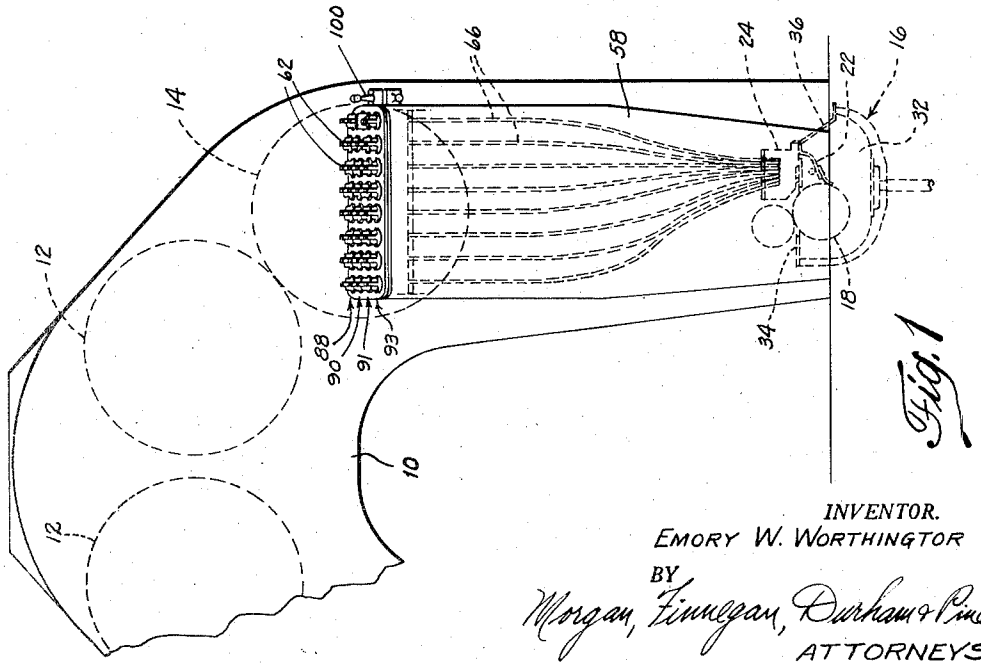


Fig. 1

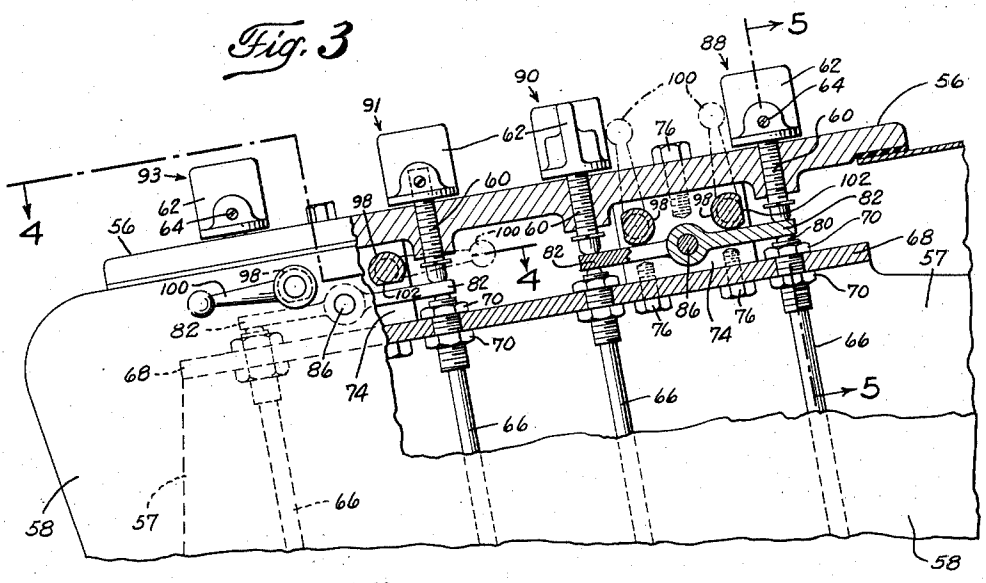
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Fig. 3



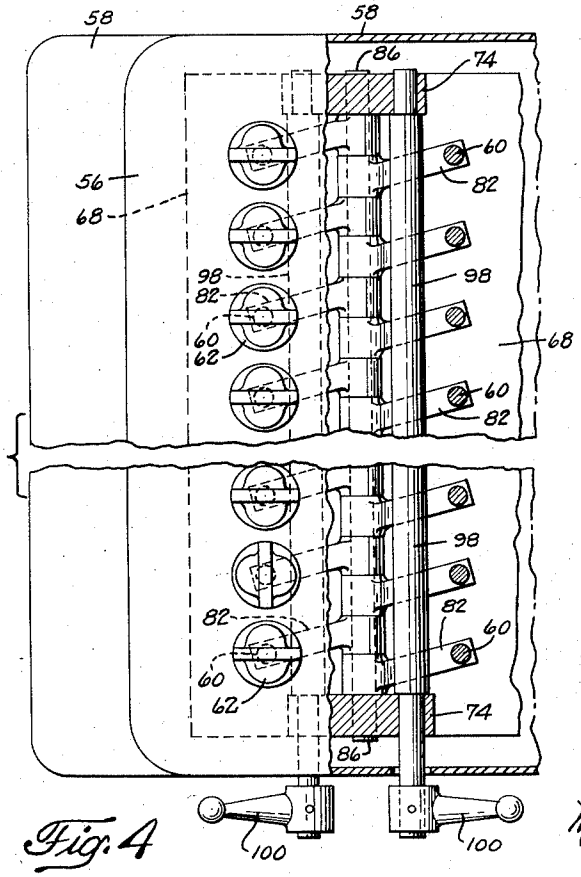


Fig. 4

Fig. 5

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Fig. 6

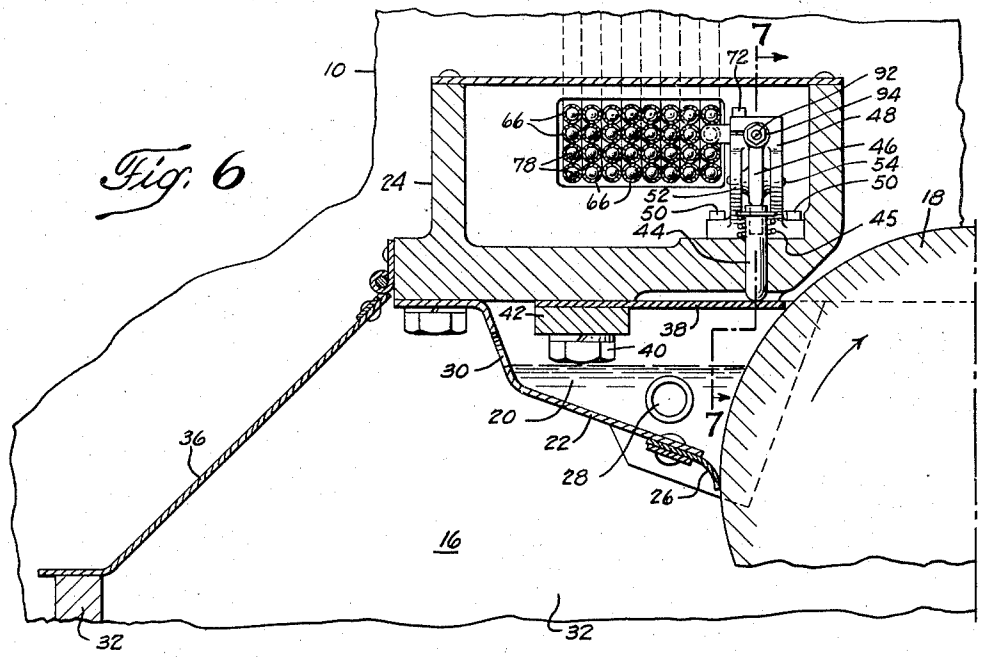


Fig. 7

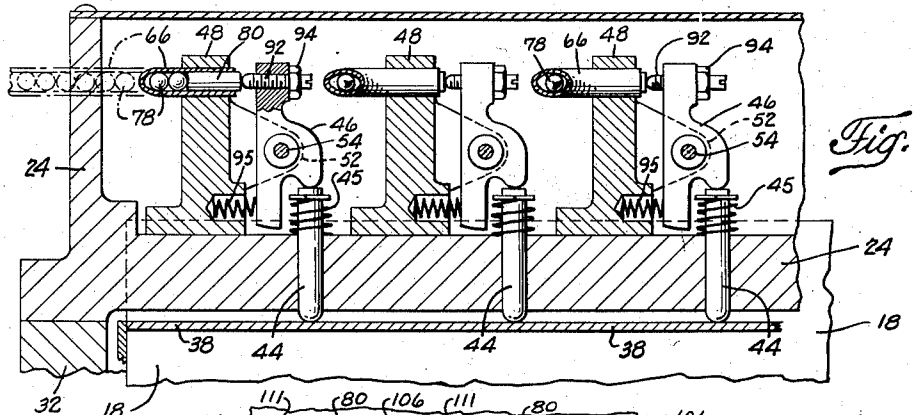


Fig. 8

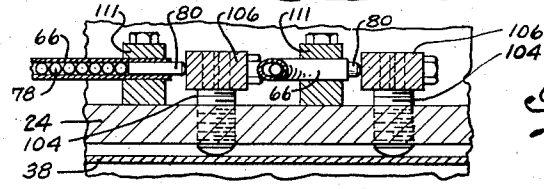
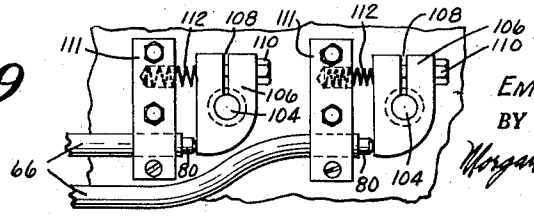


Fig. 9



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2,853,005

INK CONTROL DEVICE

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Application April 16, 1957, Serial No. 653,127

15 Claims. (Cl. 101—365)

This invention relates generally to printing presses of the rotating type and which are of multipage width and has particular relation to a control mechanism for effecting both columnar and page adjustment of ink delivery to the fountain roller of the press.

Objects and advantages of the invention will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention and together with the description, serve to explain the principles of the invention.

In the drawings:

Figure 1 is a side elevational view of a portion of a complete rotating printing press employing the present invention with portions of the ink control mechanism being shown in dotted lines.

Figure 2 is a front elevational view of the end of the printing press at which the control panel for controlling ink delivery is mounted with this view being partially broken away to show in more detail the interrelation of the end of the motion transmitting means and the means for flexing the doctor blade.

Figure 3 is a view of the control panel similar to that of Figure 2 but to enlarged scale with this view being partially broken away to show in detail the construction of the columnar actuators and the page control actuators as well as the relation of these actuators with respect to the motion transmitting mechanism.

Figure 4 is a partial sectional view of the control panel taken along line 4—4 of Figure 3 showing the mounting for the interponents associated with the front two rows of columnar actuators.

Figure 5 is a fragmentary sectional view taken along line 5—5 of Figure 3.

Figure 6 is a transverse sectional view of a portion of the ink fountain and fountain roller showing the mounting for the doctor blade and one of the columnar blade positioning members in engagement with the blade.

Figure 7 is a sectional view through a number of blade portioning members mounted on the blade carrier and is taken along line 7—7 of Figure 6.

Figure 8 is a view generally similar to that of Figure 7 but showing a modified form of blade portioning member.

Figure 9 is a top view of the modified construction of Figure 8.

It is the object of this invention to provide an improved ink delivery control for a rotating printing press of multipage width wherein both page and columnar ink control is had from a control station or panel remote from the fountain roller. Another object is to provide such a control with separate actuators mounted on the control panel for effecting page control and for effecting columnar

control of ink delivery to the fountain roller. A further object is to provide such an ink control organization wherein actuation of the page control actuator to effect page shut-off does not effect the setting of the columnar control so that upon release of the page control actuator the ink control is restored to the previous setting of the columnar actuators. Another object is to provide in such an ink control organization mechanical means for transmitting the movement of the columnar and page control actuators to the doctor blade with this means including a common interponent engaged by the columnar actuators and the page controlled actuator. Another object of the invention is to provide in such an ink control organization columnar actuators which are provided with means for indicating the position of the particular columnar control. Another object of the invention is to provide a remotely controllable ink control organization wherein both columnar and page control may be effected through separate actuators yet with the organization being relatively simple in construction and dependable in operation.

In accordance with the present invention there is provided a fountain roller of a rotating printing press with the length of the roller being several page widths (with four-page widths being customary) and with the ink film thickness delivered to the roller being controlled by means of a doctor blade associated with the roller throughout its length and being biased to a position for maximum ink film delivery. Both columnar and page control of the doctor blade is had from a central control panel or station located at one side of the printing press and elevated to a position for convenient access by an operator. Mounted on this control panel are a plurality of columnar actuators with the actuators for each page width being in alignment and preferably taking the form of screw threaded members threadedly received in the panel. Also mounted on the panel is a page shut-off control positioned adjacent each page wide group of columnar actuators. Interposed between these actuators and the doctor blade is a mechanical motion transmitting mechanism which comprises a fixed rigid tubular member extending from a position adjacent the actuators to a position on the carrier for the doctor blade adjacent the particular column control location of the blade. Within this rigid tube are balls which are of a diameter slightly less than the internal diameter of the tube and are freely movable axially within the tube. At the end of the tube secured to the control panel is a pivotally mounted interponent that is engageable by both the columnar actuator on the panel and the page shut-off actuator for transmitting the movement of each of these actuators to the axially movable balls in the tubes for moving the doctor blade towards its ink shut-off position against the blade bias. The page control actuator has two operative portions, one in which it engages the interponents of the entire page wide group of mechanical motion transmitting devices to move the doctor blade for the page width to its ink shut-off position and another position where it is free of the interponents so that the columnar actuators are the sole control members for positioning the doctor blade. By means of these interponents, actuation of the page shut-off actuator has no effect upon the position of the columnar actuators so that when the page control actuator is moved to its inoperative position from its page shut-off position the doctor blade is repositioned in accordance with the positions of the columnar actuators as they were prior to manipulation of the page control actuator.

In accordance with one embodiment of the invention movement of the columnar actuators and the page control actuator, as transmitted through the movable balls in the rigid tube of the mechanical motion transmitting

device, is effective to flex the doctor blade against its bias towards its ink shut-off position at the various column portions of the blade through a pivotally mounted member disposed adjacent the end of the rigid tube that is adjacent the doctor blade. Axial movement of the balls in the tube effects pivotal movement of this member about its pivotal axis and a spring pressed plunger is provided which is engaged by this member and which engages the doctor blade at the proper location for column ink control. In a modified embodiment a screw threaded positioning member is provided which is threadedly received in a suitable bore in the blade carrier and engages the doctor blade in order to position it as desired. At the other end of this screw threaded positioning member is provided an actuating arm which is positioned adjacent the end of the rigid tube adjacent the doctor blade and is moved by axial movement of the balls in the tube to rotate the screw threaded member.

It will be understood that the foregoing general description and the following detailed description as well are exemplary and explanatory of the invention but are not restrictive thereof.

Referring now to the drawings, wherein like reference characters are used throughout to designate like elements, the invention as illustratively disclosed therein comprises rotating printing press **10** of generally conventional form including impression cylinder **12** and printing cylinder **14** between which a web of paper is continuously passed. The width of the press and accordingly the length of cylinders **12** and **14** corresponds to four-page widths with this being the general size employed in newspaper presses.

Ink is supplied to printing cylinder **14** from a suitable ink fountain such as **16** located in the lower portion of the press with the ink being initially delivered to a fountain roller positioned within the fountain and conveyed to the printing cylinder by means of a series of distributing rolls.

As embodied in the present invention, fountain roller **18** (Figure 6) is mounted in the ink fountain and rotated in the direction indicated. A pool of ink **20** is maintained in contact with the fountain roller as shown by means of plate member **22** which is secured to the lower end of doctor blade carrier **24** that is supported on the frame of the press and which forms with the roller a receptacle for the ink pool. The forward edge of plate **22** is spaced somewhat from the periphery of the fountain roller and is provided with a flexible seal member **26** which engages the roller periphery in a manner to prevent any substantial leakage of ink. Fresh filtered ink is continuously supplied to pool **20** through the distributing conduit **28** with the level of the pool being maintained constant and the ink continuously overflowing through the overflow openings **30** provided in plate **22**. The overflow ink is collected in the catch basin **32** with this ink being filtered and returned to the pool **20** through conduit **28**. In order to prevent foreign matter from falling into the catch basin plate members **34** and **36** are provided at the upper end of the basin with plate member **36** being pivotally mounted on blade carrier **24** to permit access to the basin.

The thickness of the ink film that is applied to roller **18** is regulated by the doctor blade **38** which is secured to the bottom of the blade carrier by means of cap screws **40** with the blade being clamped between the elongated rigid member **42** and the bottom of the carrier **24**. The doctor blade is sufficiently flexible so that a portion of the plate which corresponds to a single column width of the press may be flexed toward and away from the fountain roller through the range of movement that is required to control the ink delivery between ink shut-off and maximum ink film thickness without substantially effecting the laterally adjacent columnar portions of the blade. In lieu of the continuous blade construction shown, the blade may be laterally slotted between adjacent column locations if desired. Doctor blade **38** is naturally biased by its own flexibility to the position where it provides for maximum ink film thickness and is moved from this position toward its ink shut-off position where it wipes the roller by positioning members which extend through the lower portion of carrier **24** and engage the blade. There is provided one such positioning member engaging the blade for each columnar width of the blade and in the illustrative organization thirty-two such positioning members are had to actuate a four-page width with eight columns per page. In the embodiment of Figures 1–7 the positioning member that engages the blade at its columnar locations comprises plunger **44** slidably received within a suitable bore provided in the blade carrier **24** with spring **45** being positioned about the plunger in a manner to urge it away from the blade so that it does not by means of its own weight urge the blade towards the fountain roller. Axial movement of plunger **44** is had through the bell crank **46** which engages the upper end of the plunger and is mounted on bracket **48** which is in turn secured to the blade carrier by means of cap screws **50**. The bracket **48** is provided with a pair of laterally extending ears **52** between which bell crank **46** is mounted for pivotal movement about shaft **54** that extends between and is supported by these ears.

Actuation of each of the bell cranks **46** and accordingly each of the plungers **44** is had from a central control station or panel positioned at one side of the press. As illustratively disclosed this control panel comprises a plate or panel member **56** inclined slightly from the horizontal for easy access by the pressman and disposed at the upper end of housing **58** which is secured to the side of the press. Threadedly received in panel **56** are thirty-two separate columnar actuators **60** which are arranged in four rows (**88**, **90**, **91** and **93**) of eight actuators each as shown in Figure 1 with the eight actuators of each row controlling a page wide series of blade positioning members. The outer end of each columnar actuator **60** is provided with a winged operator **62** which is secured to the actuators by pin **64** with these winged operators providing a visual indication of the rotative position of the actuators as is evident from Figure 4.

The movement of actuators **60** is transferred to their respective bell cranks **46** through a mechanical motion transmitting mechanism which includes the rigid tube **66** which is secured at one end to the fixed plate **68** by means of nuts **70** and to the respective bracket **48** at the other end with the bracket being slotted and provided with a clamp screw **72** as indicated in Figure 6 to clamp the end of the tube to the bracket. The plate **68** is mounted on the upper end of frame **57** of the housing and the plate **68** and panel **56** are secured together by the spaced brackets **74** provided at opposite ends of the plate and panel with their being four such brackets and with the brackets being secured to the plate and the panel by means of cap screws **76**. Disposed within rigid tube **66** are the balls **78** which are slightly smaller in diameter than the inside diameter of the tubes so that they are freely movable axially within the tubes. Loosely received in each end of the tube is a dowel pin **80** which extends from the end of the tube and is engaged by the end most ball.

Between the end of each column actuator **60** and the dowel pin **80** extending from the upper end of the respective tube **66** is an interponent **82** which is pivotally mounted on shaft **86** with this shaft being mounted in suitable bores provided in the spaced brackets **74**. As shown in Figures 3 and 4 there are two such shafts **86** with the interponents for the rows **88** and **90** of actuators **60** mounted on a common shaft **86** and extend in opposite directions from the shaft to their operative positions between their respective actuator **60** and dowel pin **80** and the interponents for rows **91** and **93** being simi-

larly mounted on a common shaft **86**. Thus by rotating columnar actuator **60** so that by its screw threaded connection it is axially moved as desired, this axial movement is transmitted to bell crank **46** through interponent **82** dowel pins **80** and balls **78**. The dowel pin **80** at the lower end of the tube **66** engages the adjustable member **92** which is threadedly received by the upwardly extending leg of the bell crank and locked in its desired position by lock nut **94**. By means of this adjustable abutment the initial position of the entire actuating mechanism may be adjusted so that with the doctor blade unflexed and occupying its position for maximum ink delivery to the fountain roller the winged operators **62** will be in a particular and predetermined orientation so that the rotative position of the winged operator will indicate the position of the doctor blade at the particular column location with which the operator is associated. The weight of the motion transmitting mechanism is counterbalanced by spring **95** acting against bell crank **46**. In order to provide a step-wise or incremental adjustment of the columnar actuators **60** the lower surface of winged operators **62** is provided with radially extending serrations and urged into engagement with this serrated surface is the spring pressed detent **96**. It will thus be seen that through manipulation of columnar actuator **60** the columnar positions of the doctor blade **38** may be independently adjusted throughout the entire four-page width length of the blade to effect columnar control of the thirty-two separate columns.

In order that page control of each of the four-page widths may be had entirely independently of the particular position of the column actuators **60** there is mounted on the control panel a separate page control for each page wide group of doctor blade positioning members. Each of these page controls as illustratively indicated comprises cam bar or rod **98** which extends between and is mounted in a pair of the spaced brackets **74** with the ends of the rods received in these brackets being of reduced diameter and with one end of each rod extending to the exterior of the control panel housing **58** and upon which end is secured the actuating handle **100**. The rods are positioned immediately above the interponents **82** for each of the rows of actuators on the control panel and are provided with a flattened surface **102** arranged so that when the page control rods are in a position where the flattened surface is parallel or generally parallel with the interponents, the page control cam bar is out of engagement with the page wide group of interponents and control of the particular page wide group of positioning members is had solely by means of the column actuators **60** while when the page control rod is rotated by means of handle **100** from this position the interponents **82** for this page wide group are simultaneously engaged by the page control rod and through cam action moved so as to cause the positioning members to position the blade for page shut-off. As shown in Figure 3 the page controls for rows **88** and **90** are in their page shut-off position while those for rows **91** and **93** are in a position where column actuators **60** are the sole controlling members for positioning the doctor blade. With this organization, actuation of the page control from its normally ineffective position to its page shut-off position is entirely independent of the column actuators **60** so that when the page control is released or moved from its page shut-off to its ineffective position the doctor blade is returned to the columnar adjusted positions that prevailed prior to manipulation of the page control.

Figures 8 and 9 show a modified form of positioning member in lieu of the pivotal bell crank **46** and axially moved plunger **44**. In this modified construction there is provided a threaded member **104** threadedly received in the lower portion of blade carrier **24** at the several columnar locations along doctor blade **38** with the end of this member engaging the doctor blade. Secured to the other end of this member **104** is the lever **106** which is slotted at **108** and is clamped to member **104** by means of cap screw **110** which is effective to draw the fingers on each side of this slot together. The end of tube **66** is clamped in bracket **111** adjacent this lever so that one end of the lever is engaged by the dowel pin **80** while the other is engaged by spring **112** which is effective to overcome the weight of the mechanical actuating mechanism including interponent **82** and balls **78**. The initial adjustment of this modified organization is had by loosening cap screw **110** and positioning the threaded member **104** at its proper initial position when the columnar operators **62** are in their proper initial position and thereafter tightening this cap screw to securely clamp the lever in its then properly adjusted position. With this embodiment, as the columnar actuators **60** are adjustably positioned as desired, member **104** is rotated by the positioning of these actuators with the rotation of this member causing it to move axially and accordingly position the doctor blade. With this arrangement a very fine or precise positioning of the blade may be had.

With this invention there is thus provided both a columnar and a page control of the doctor blade from a central control station or panel remote from the doctor blade and located for convenient access by the pressman. The page control is effected by manipulation of a single actuator without having to preset or adjust any other mechanism and the operation of the page control does not destroy the setting of the columnar control members so that upon release of the page control member from its page shut-off position the previously existing columnar control is reinstated.

The invention in its broader aspects is not limited to the specific mechanism shown and described but departures may be made therefrom, within the scope of the accompanying claims, without departing from the principles of the invention and without sacrificing its chief advantages.

What is claimed is:

1. In a printing press ink control the combination of control blade means, adjustable positioning members disposed adjacent said blade means for positioning the same for columnar ink control, means for independently and individually actuating said positioning members including an actuating member for each such positioning member, an interponent disposed between said actuating member and positioning member through which the motion of the actuating member is transferred to the positioning member and page control means including an adjustable actuating member operative in one position to simultaneously engage the interponents and move them to a position to effect page shut-off and in another position being out of engagement with said interponents.

2. In a printing press ink control the combination of control blade means, adjustable positioning members disposed adjacent said blade means for positioning the same for columnar ink control, individual motion transmitting means extending from each positioning member to a common control station remote from the members, an adjustable actuating member at said station for each transmitting means operative to adjustable and individually position each positioning member through the transmitting means for columnar ink control, an interponent disposed between the adjustable actuating member and the motion transmitting means and a page control member engageable with said interponent and movable to and from a position where it is effective to simultaneously position said interponents independently of said actuating member so as to effect page shut-off and a position where it is free of said interponents.

3. The organization of claim 2 wherein the motion transmitting means comprises a fixed tubular member within which is disposed balls of a diameter slightly less than the inside diameter of the tube and freely movable therewithin to transmit the movement of the actuating

members and the page shut-off to the positioning members.

4. The organization of claim 2 wherein the adjustable positioning members includes a pivotally mounted member actuated by the motion transmitting means and a plunger bearing against the blade means and actuated by the pivotally mounted member.

5. The organization of claim 2 wherein the adjustable positioning members includes a screw actuated member bearing against the blade means and means operated by the motion transmitting means effective to rotatably adjust said screw actuated member.

6. In a rotating printing press a fountain roller of multipage length extending thereacross, flexible control blade means extending along said roller in juxtaposition thereto to control the thickness of the ink film on the roller, individual adjustable means at the columnar locations across the press operative to separately adjust said blade means at said locations to effect columnar ink control, remote actuating mechanism for said adjustable means including a control panel having disposed thereon an independent and accurately adjustable member for each such means, mechanical means effectively interconnecting each member with its respective blade adjusting means for accurate adjustment of said blade by said member, an adjustable page control independent of said members for each group of adjustable means disposed across a page width, said page control means being mounted on said control panel and operatively related with the mechanical interconnecting means associated with the adjustable means of their respective group and effective in one position to simultaneously position the adjustable means of their group through the interconnecting means for page shut-off independently of said members and in another position permitting said members to be the sole regulator of said adjustable means.

7. The organization of claim 6 wherein the mechanical means effectively interconnecting each member with its blade adjusting means comprises a fixed tubular member having balls disposed therein and freely movable therewithin with the diameter of the balls being slightly less than the inside diameter of the tube.

8. In a rotating printing press of multipage width the combination of a fountain roller extending thereacross, a flexible control blade mounted adjacent said roller for controlling the ink film thickness thereon and biased to a position for maximum film thickness, remote control means for regulating said blade to effect both columnar and page ink control, said means comprising column adjusting screws mounted on a control panel remote from the control blade, mechanical means for transmitting the movements of said adjusting screws to the blade at the corresponding columnar positions along the blade to position the blade as desired against its bias, a common page control member mounted on said control panel for each group of mechanical transmitting means controlling a page wide extent of the blade, each of said mechanical means including a common member adapted to be engaged by both the adjusting screw and the page control member for moving the blade toward ink shut-off against its bias but remaining free of the adjusting screw and page control means so that it may move relative thereto in the direction to effect ink shut-off, said page control being operative in one position to engage said common member of the page wide group and through the mechanical means effect page shut-off entirely independently of the adjusting screws and in another position being ineffective to actuate said blade and permitting the adjusting screws to be the sole regulator of the blade positioning.

9. The organization of claim 8 wherein the adjusting screws include means providing a visual indication of their rotative position and accordingly of the control position of the blade.

10. In a rotating printing press of multipage width the combination of a fountain roller extending thereacross, a flexible control blade mounted adjacent said roller for controlling the ink film thickness thereon and biased to a position for maximum film thickness, remote control means for regulating said blade to effect columnar and page ink control, said means comprising accurately adjustable actuators for columnar ink control, a control panel means remote from the blade and upon which said actuators are mounted, mechanical means for transmitting movements of the accurately adjustable actuators to the blade at the corresponding columnar positions along the blade to position the blade as desired against its bias and including fixed rigid tubes extending between the panel means and blade and containing balls of a diameter slightly less than the inside diameter of the tubes so that they are freely movable longitudinally within the tubes, a common page control actuator mounted on said panel means for each page wide group of mechanical transmitting means, each of said mechanical transmitting means also including a common member adapted to be engaged by both the columnar actuator and the page control actuator in a manner to move said member and said transmitting means in the direction of ink shut-off while permitting movement of said member in this direction relative to each of these actuators, said page control actuator being operative in one position to engage said common member of a page wide group of motion transmitting means and effect page shut-off entirely independently of the adjustable actuators and in another position being ineffective to actuate the blade and permitting the column actuators to be the sole regulator of blade positioning.

11. In an organization of the type described the combination of doctor blade means for a rotating printing press of multipage width, said blade being biased for maximum ink delivery, a control panel remote from the blade means at one side of the press from which said blade means is regulated for both columnar and page ink control, independently manually adjustable columnar actuators mounted on said panel, with each page wide group of actuators being in alignment, mechanical means for transmitting movements of said actuators to said blade means at the corresponding columnar positions therealong to position the blade means as desired against its bias for columnar ink control and including a rigid tube extending between the panel at the location of each actuator and the blade means and containing balls of a diameter slightly less than the inside diameter of the tubes so that they are freely movable longitudinally within the tubes and accordingly transmit the movements of the actuators to the blade means, and an interponent mounted adjacent the end of the tube secured to the panel and disposed between said tube end and the associated actuator so as to be engaged by the actuator to transmit movement of the actuator to said balls, a page control actuator on said panel for each page wide group of mechanical means operative in one position to engage said interponent and through the mechanical motion transmitting means move the page wide extent of the doctor blade to its ink shut-off position and in another position permitting the adjustable actuators to be the sole regulator of blade positioning, said interponent being movable relative to the columnar actuators and the page control actuators in the direction to effect ink shut-off.

12. In a rotating printing press of multipage width the combination of a fountain roller extending thereacross, a flexible doctor blade mounted adjacent said roller for controlling the ink film thickness thereon and biased to a position for maximum film thickness, a control panel disposed at one side of the press remote from the doctor blade and from which both columnar and page control regulation of the blade is had, remote control means for effecting such regulation including independently, manually adjustable columnar actuators mounted on said panel with each page wide group of actuators being in

alignment, mechanical means for transmitting movements of said actuators to said blade as desired against its bias including a rigid tube extending between the panel at the location of each actuator and the blade and containing balls disposed therewith of a diameter slightly less than that of the tube so that they are freely movable axially thereof and accordingly transmit the movements of the actuators to the blade, a manually operated page control actuator on the panel for each page wide group of mechanical transmitting means and including a cam disposed adjacent and parallel with the row of columnar actuators for the group, each mechanical means including an interponent in the form of a member pivotally mounted on the panel and adapted to be engaged by both the columnar and page control actuators for moving the blade against its bias toward ink shut-off through said balls but being movable in this direction relative to both of these actuators, each of said page controls being operative between a position where it is effective to simultaneously engage the interponents of the particular group and cam them to a position to effect page shut-off and a position where it permits the columnar actuators to be the sole regulators of the blade position.

13. The organization of claim 12 wherein there are four parallel spaced rows of aligned columnar actuators and the pivotally mounted interponents of each outermost row are mounted on a common shaft with those of the row adjacent thereto with said shaft extending between and in parallel relation with the outermost row and the row adjacent thereto.

14. The organization of claim 12 wherein the movement of the balls axially of said tubes is imparted to the blade through a plunger bearing against the blade and actuated by a bell-crank that is effectively moved by said balls.

15. The organization of claim 12 wherein the movement of the balls axially of said tubes is imparted to the blade through a screw actuated member bearing against the blade and means effectively actuated by said balls operative to rotatably adjust said screw actuated member.

No references cited.