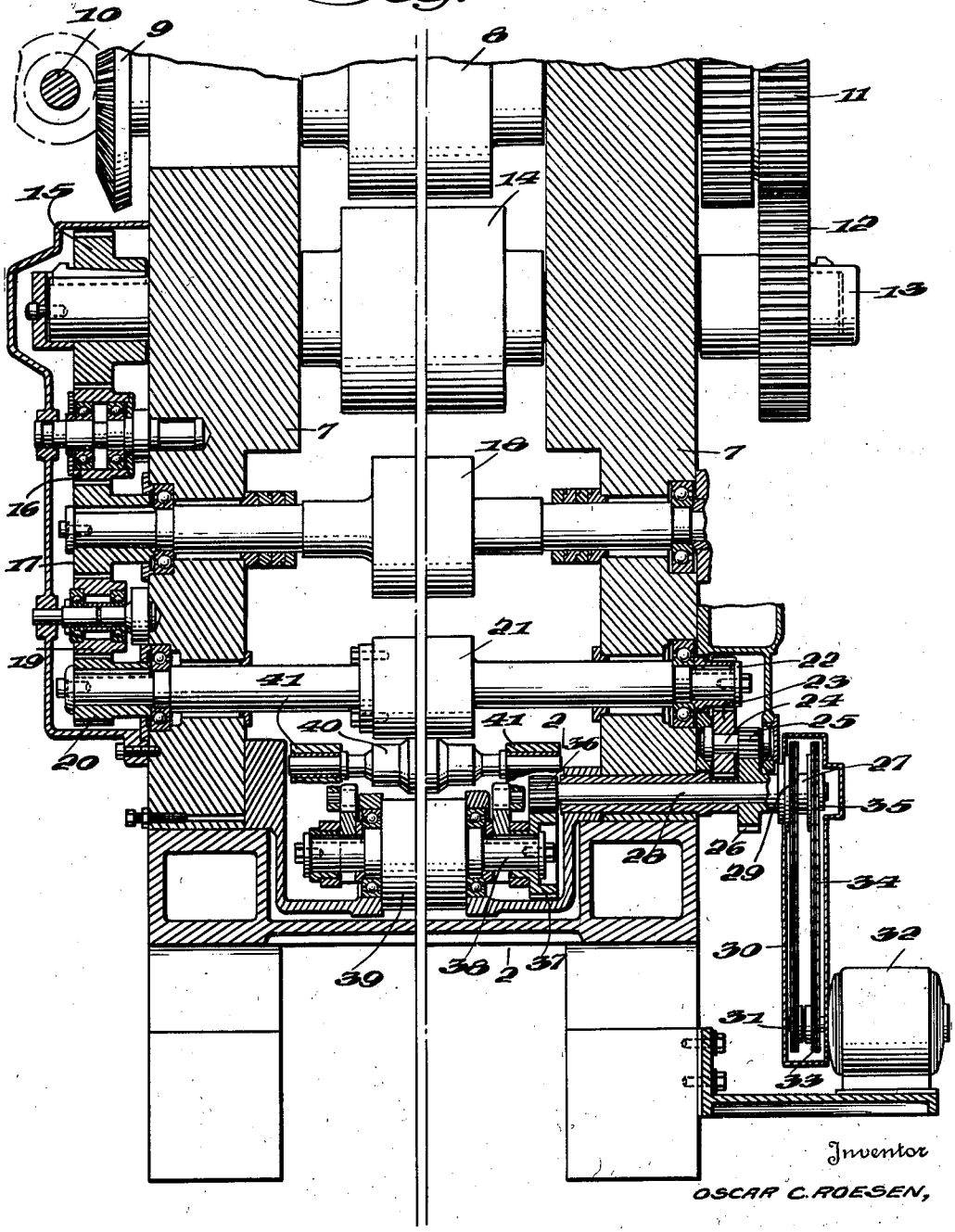
June 2, 1942. O. C. ROESEN 2,285,052

VARIABLE FOUNTAIN INK SUPPLY FOR PRESSES

Filed July 11, 1941 4 Sheets-Sheet 1

Fig. 1.



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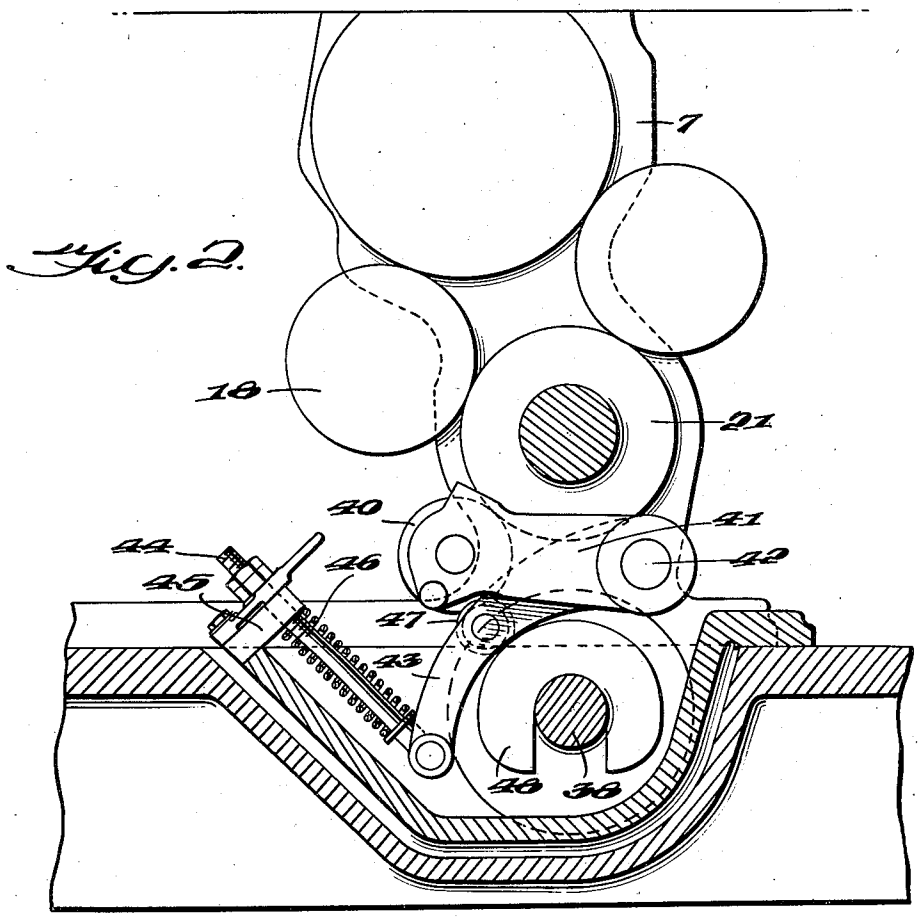
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VARIABLE FOUNTAIN INK SUPPLY FOR PRESSES

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Fig. 2.



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VARIABLE FOUNTAIN INK SUPPLY FOR PRESSES

Filed July 11, 1941 4 Sheets-Sheet 3

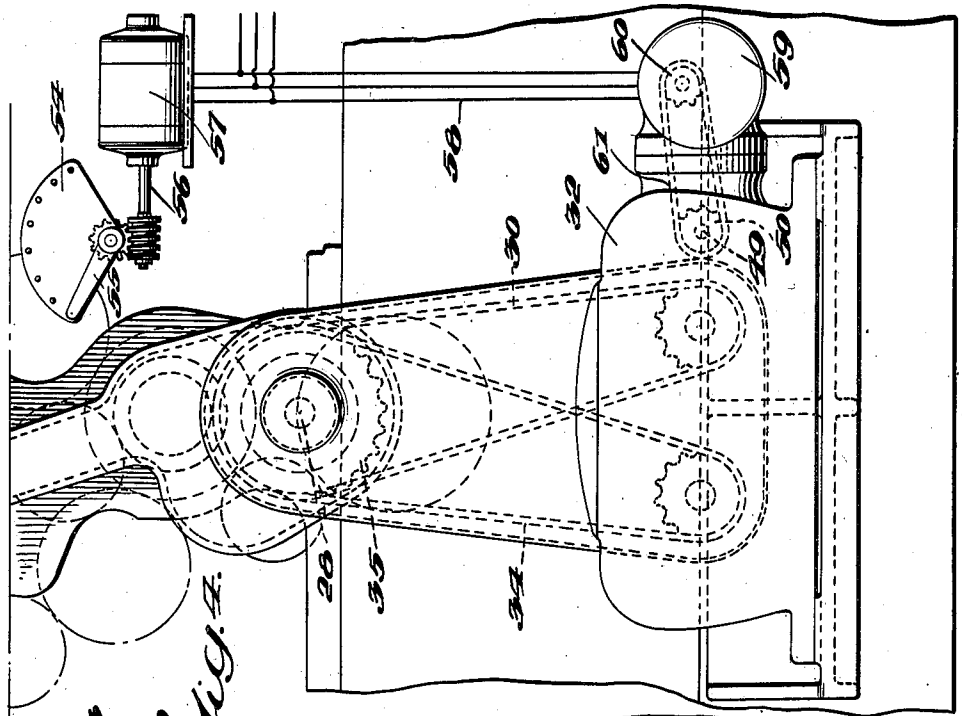


Fig. 4.

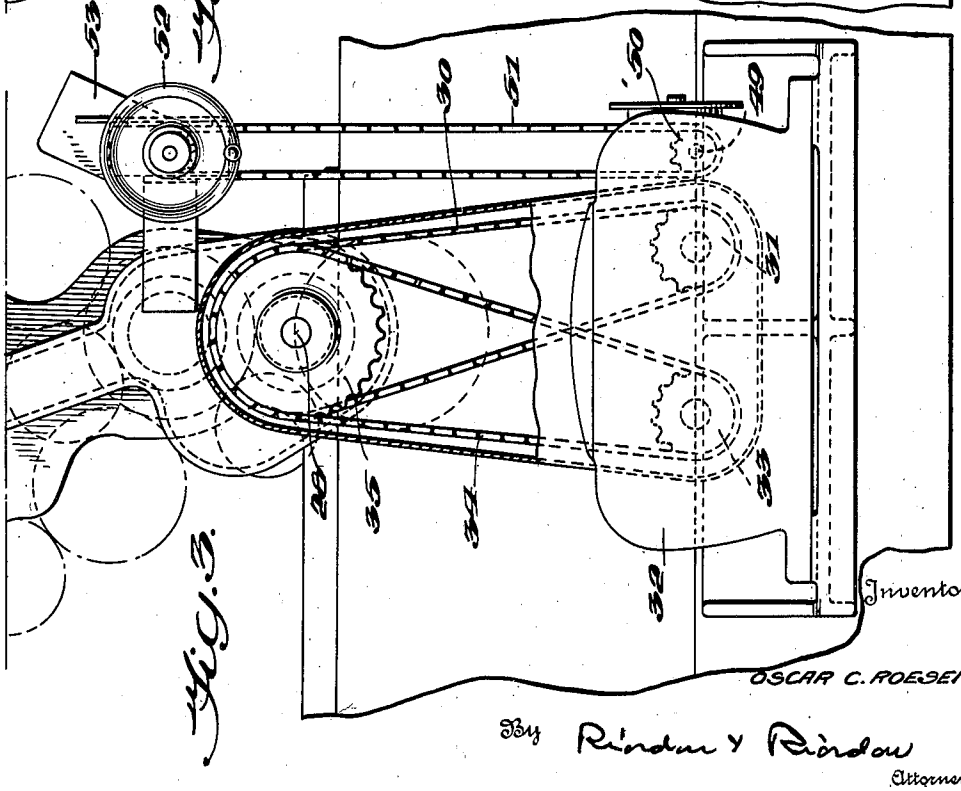


Fig. 3.

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VARIABLE FOUNTAIN INK SUPPLY FOR PRESSES

Filed July 11, 1941 4 Sheets-Sheet 4

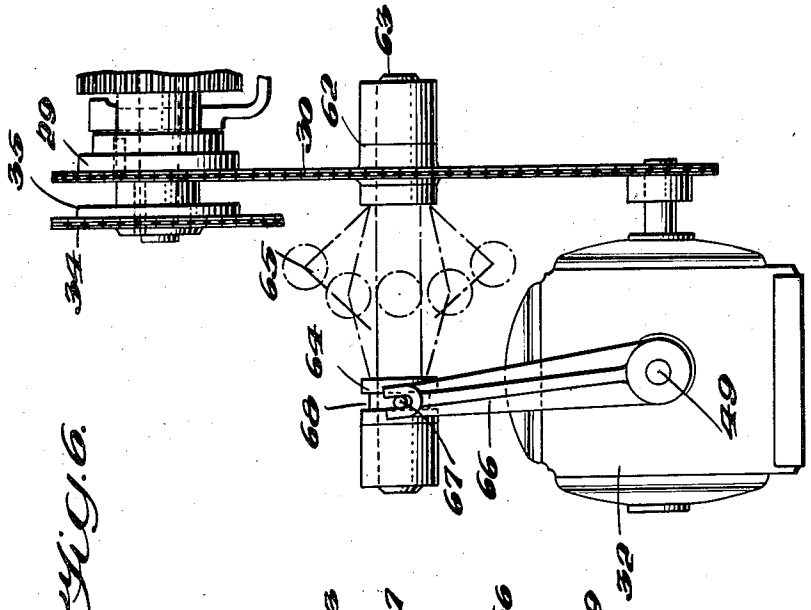


Fig. 6.

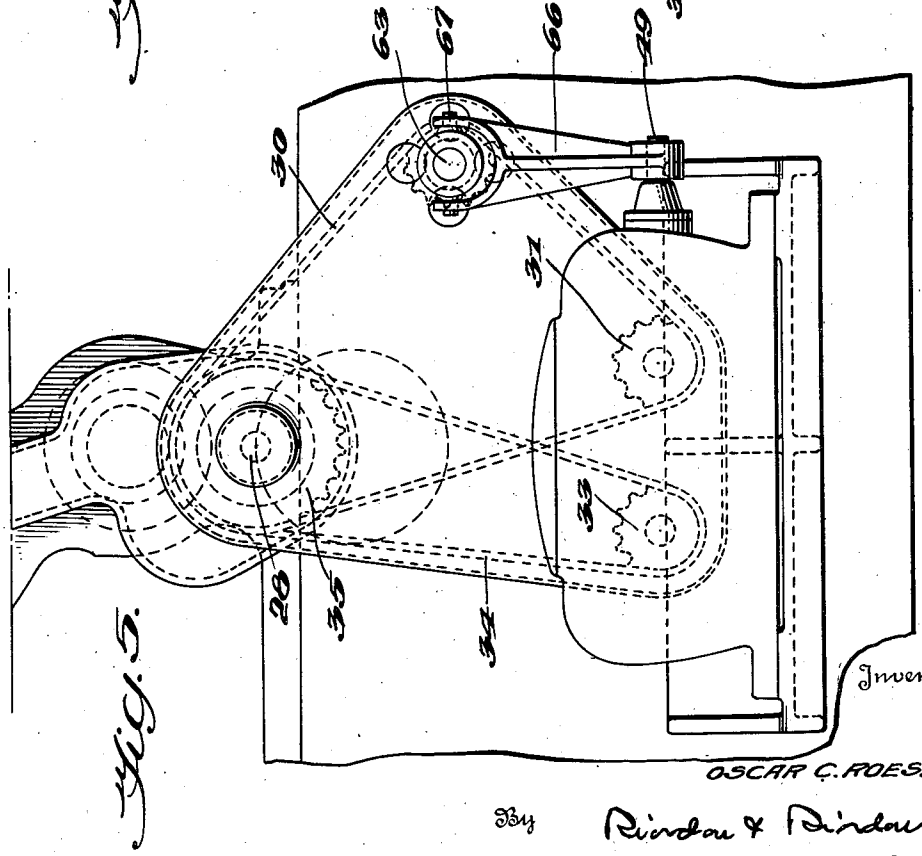


Fig. 5.

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Patented June 2, 1942 2,285,052

UNITED STATES PATENT OFFICE

2,285,052

VARIABLE FOUNTAIN INK SUPPLY FOR PRESSES

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Application July 11, 1941, Serial No. 402,010

15 Claims. (Cl. 101—350)

This invention consists in certain improvements in a speed variable fountain ink supply for regulating the distribution of ink in roller cylinder printing presses, particularly of the type of newspaper printing presses employing the ductor roll type of ink motion.

It is a well known fact that inking mechanisms and particularly those employing a ductor roll to transfer ink from a relatively slow running fountain roll to a relatively fast running ink roll in the train of inking rollers will transfer less ink per printed page when the press is running at a reduced speed and gradually transfer more ink as the press accelerates to its normal and higher running speed. Obviously this results in a light printed page during the reduced speed of the press which naturally must occur every time the press accelerates or decelerates such as when starting on a run or when slowing down for hand pasters or when shutting down for web breaks or any of the numerous reasons. This variation in the color of the printed page due to the unequal distribution of ink over the entire speed range of the press is objectionable and with the existing conventional ink adjustments found on presses, it is practically impossible for the pressman to manually correct this trouble by the manipulation of these adjustments during the running period of the press.

Numerous theories have been advanced to explain this variation in color of printed page over the speed range of press, but the premise on which this invention is based takes into account the spinning of the ductor roll (due to inertia) as it contacts the slow running fountain roll. In contacting with the fountain roll a wiping action takes place which increases with the speed of the press, thereby picking up a greater amount of ink at the higher speed due to the increased wiping action of ductor roll in contact with the fountain roll. From the above it has been concluded and also substantiated by experiment that a variation in the revolutions of the fountain roll and change in ductor cycle relative to the printing or running speed of the press will compensate for the variation in the wiping effect of the ductor roller and consequently maintain an approximately uniform ink distribution regardless of the press speed. Imparting the required variable speed to the fountain roll is readily accomplished by suitable drive mechanism which lends itself readily to both manual and automatic control and the purpose and scope of this invention embraces not only the basic principles of a variable speed fountain roll and ductor cycle but also in combination with manual and automatic control means which in turn operate in proper relation to press speed by such regulating means as a centrifugal governor or an electromotive positioning mechanism operating from the variable speed controller of the press main drive motor.

An object of my invention is to compensate for changes in speed of the printing operation and the resultant variation in the amount of ink supplied so that regardless of such variations and speed, a uniform amount of ink will be distributed upon the printing cylinder and thus insure printing with uniform intensity.

A further object of my invention is to make this adjustment possible regardless of whether it is done through the manual agency of the pressman or alternatively by means interconnected with the power of the printing press as applied through the lower ink drum.

A further object of my invention is to adapt the well known and conventional type of variable transmission sets for the manual or automatic adjustment of the inking operation.

Other objects of my invention will be readily apparent from the following description of the preferred form of my invention as illustrated by way of example on the accompanying drawings in which

Fig. 1 is a front elevation, partly in section, of a printing press showing the variable speed supply means for the roller of the inking fountain;

Fig. 2 is a side elevation partly in section of the ink supply roller train taken on the line 2—2 of Fig. 1;

Fig. 3 is a side elevation of the variable speed ink supply under manual control;

Fig. 4 is a side elevation of an electrical control of the variable speed transmission interconnected with the main press drive control;

Fig. 5 is a side elevation of the variable fountain ink supply controlled by a centrifugal governor and interconnection between variable speed transmission and the press rolls, and

Fig. 6 is an end view of the same.

In its broad aspects the invention provides for adjusting the frequency of transfer of ink by a ductor roll from a fountain roll to a lower ink drum to compensate for irregularity of feed due to speed and to maintain a uniform transfer of ink to the ink drum and, therefore, to the printing surface. To carry out this purpose I have interposed a variable speed transmission

set in the train of gearing running from the lower ink drum to the fountain roll and thus indirectly to the ductor roll. In this way it is possible to vary the functioning of the ductor roll with respect to the lower ink drum. This will insure that the latter at all times and regardless of speed of the printing press will transfer a uniform amount of the ink. It may be added at this point in accordance with the observations made and the theories stated above the rate of functioning of the ductor roll, i. e., its speed should become less as the speed of the printing increases. I have referred to this function as an inverse variation without limiting myself to the extent of variation as being in inverse "proportion."

The frame members 7, 7 of the printing press carry the usual series of rollers. Thus Fig. 1 shows the first impression cylinder 8 journalled in opposite parts of the frame 7, 7 and carrying at one end a beveled gear 9 in mesh with a similar gear on the power shaft. The opposite end of the roll 8 carries a connecting gear 11. This gear is in mesh with a corresponding gear 12 keyed on the end of the shaft 13 of the plate cylinder 14.

On the opposite end of the shaft 13 there is a gear 15. This gear is in mesh with an idler 16 which in turn engages gear 17 of the customary ink drum 18.

A second idler 19 transmits power from the gear 17 to a gear 20 which is keyed on the shaft of the lower ink drum 21. The train of gears 15, 16, 17, 19 and 20 thus form a source of power from the printing press to the lower ink drum 21.

The opposite end of the lower ink drum shaft has keyed to it a pinion 22 which is in engagement with the gear 23 fixed on a shaft 24. Shaft 24 also carries a pinion 25 in mesh with the gear 26 on the sleeve 27. The sleeve 27 is loosely journalled upon the shaft 28 which in turn is carried in bearings on the frame 7.

The sleeve 27 has a sprocket 29 which is connected by means of chain 30 to an input sprocket 31 which forms part of a variable speed transmission set 32.

The variable speed transmission set 32 is of the ordinary well known type which converts the power received from the chain 30 to an output power of a different speed. The speed of the output may be adjusted, varied or controlled in the usual manner.

The output sprocket 33 connects by means of chain 34 with a sprocket 35 fast upon the shaft 28.

At its inner end shaft 28 carries a fixed pinion 36. This pinion is in mesh with the gear 37 keyed on the shaft 38 of a fountain roll 39.

A ductor roll 40 is journalled at opposite ends in bearings in rock arms 41, 41. Rock arms 41, 41 are fixed at their ends to a rock shaft 42 (Fig. 2). Also fixed to the rock shaft 42 is a pair of levers 43, 43. The free ends of the levers 43 are pivotally connected to spring rods 44 which extend through lugs 45 on the frame. An expansive coil spring 46 maintains each spring rod 44 and the corresponding lever 43 in its downward limit of motion except when lifted by the operating cam.

At mid-points on the levers 43 there are cam rollers 47. These cam rollers travel on the periphery of cams 48 which are keyed to the shaft 38 of the fountain.

It will be evident that as the fountain roll 39 is rotated the cams 48 will cause the lever arms 43 to rise and fall. This results in the ductor roll leaving its contact with the surface of the fountain roll and coming up into contact with the lower ink drum. One such contact is made for each revolution of the fountain roll regardless of the speed of the latter or the printing press of which it is a part.

To compensate for changes in speed of the printing press and to render uniform the transfer of ink from the fountain roll to the lower ink drum by means of the ductor roll, I have interposed the variable speed transmission set 32. The variation in speed effected by the transmission set can be adjusted in one of several satisfactory ways.

In Fig. 3 the adjustment is shown manually. A shifter shaft 49 forming a part of the transmission set 32 carries a sprocket 50. This sprocket is connected by means of chain 51 to a hand wheel 52 conveniently supported at the proper level of the printing press structure. An indicating dial 53 assists in determining the position found most effective at the known speed.

Variation in speed of the output of the transmission set 32 may also be controlled automatically in any one of a number of ways. In Fig. 4, I have shown parts of a printing press controlled by a main press control panel 54. A controller contact arm 55 is connected by worm and gear to the shaft 56 of a positioning actuator 57.

Electrical connections 58 from the postioning actuator 57 operate a postioning motor 59. By means of sprocket 60 and chain 61 the desired adjustment sprocket 50 and the shifting shaft 49 is carried out.

A still further method of automatic control is shown in Figs. 5 and 6 wherein the shifting shaft of the transmission set is controlled by a centrifugal governor actuated by the input. The chain 30 running from the sprocket 29 is extended around a second sprocket 62 on a freely rotatable shaft 63. This shaft 63 has a free running collar 64 connected to sprocket 62 by means of a series of fly-balls 65. The shifting shaft 49 has a yoke 66 with anti-friction members 67 running in the groove 68 of the collar 64.

By increase in speed the fly balls 65 of the governor extend centrifugally drawing the collar 64 inward toward the sprocket 62. This causes the shifting shaft 49 to reduce the speed of the output from the transmission 32.

Operation of the arrangement above described will be readily understood. Power from the shaft 10 of the printing press is indirectly delivered from the shaft of the lower ink drum 21. From there the power is delivered through the transmission set 32 at variable speeds to shaft 28 and the associated mechanism of the fountain roll 39 and the ductor roll 40. In this way the velocity of action by the ductor roll is varied relatively to the speed of the lower ink drum 21.

This compensating variation in speed of inking is adjustable to the transmission set 32 manually by means of the hand wheel 52 and associated parts.

Where it is desired to interconnect the main press control with this variable ink supply means, it may be done either electrically as shown by the device illustrated in Fig. 4 or purely mechanically by means of the centrifugal governor illustrated in Figs. 5 and 6. In either modification the input of the transmission set is translated to an output of adjusted speed automatically by the movement of the printing press.

As previously stated this compensation for variation in the inking feed will generally be in an

inverse direction to the speed of the main press. In other words, the contact of the ductor roll with the lower ink drum will be more frequent at lower speeds than at higher speeds.

While I have expressly illustrated the preferred form of my invention, it is to be understood that many changes may be made in size, proportion and specific details without departing from the spirit of the invention and its scope as defined in the following claims.

What I claim is:

1. The combination with an ink drum, a fountain roll and a ductor roll therebetween, of means for varying the contact of the ductor roll with the ink drum comprising a variable speed transmission unit, gearing from the ink drum to the said unit, gearing from the unit to the fountain roll, means for actuating the ductor roll from the fountain roll and means for varying the ratio of speed through the said transmission unit.

2. The combination with an ink drum, a fountain roll and a ductor roll therebetween, of means for varying the contact of the ductor roll with the ink drum comprising a variable speed transmission unit, gearing from the ink drum to the said unit, gearing from the unit to the fountain roll, means for actuating the ductor roll from the fountain roll and means for varying the ratio of speed through the said transmission unit inversely with the speed of the ink drum.

3. The combination with an ink drum, a fountain roll and a ductor roll therebetween, of means for varying the contact of the ductor roll with the ink drum comprising a variable speed transmission unit, gearing from the ink drum to the said unit, gearing from the unit to the fountain roll, means for actuating the ductor roll from the fountain roll and automatic means for varying the ratio of speed through the said transmission unit.

4. The combination with an ink drum, a fountain roll and a ductor roll therebetween, of means for varying the contact of the ductor roll with the ink drum comprising a variable speed transmission unit, gearing from the ink drum to the said unit, gearing from the unit to the fountain roll, means for actuating the ductor roll from the fountain roll and automatic means for varying the ratio of speed through the said transmission unit inversely with the speed of the ink drum.

5. The combination with an ink drum, a fountain roll and a ductor roll therebetween, of means for varying the contact of the ductor roll with the ink drum comprising a variable speed transmission unit, gearing from the ink drum to the said unit, gearing from the unit to the fountain roll, means for actuating the ductor roll from the fountain roll and manual means for varying the ratio of speed through the said transmission unit.

6. The combination with a power driven cylinder printing press having a power control, an ink drum, a fountain roll and a ductor roll therebetween, of means for varying the contact of the ductor roll with the ink drum comprising a variable speed transmission unit, gearing from the unit to the fountain roll, means for actuating the ductor roll from the fountain roll and means interconnected with said power control for varying the ratio of speed through the said transmission unit.

7. The combination with a power driven cylinder printing press having a power control, an ink drum, a fountain roll and a ductor roll therebetween, of means for varying the contact of the ductor roll with the ink drum comprising a variable speed transmission unit, gearing from the unit to the fountain roll, means for actuating the ductor roll from the fountain roll and an electrically operated shifting mechanism connected with said power control for varying the ratio of speed through the said transmission unit.

8. The combination with an ink drum, a fountain roll and a ductor roll therebetween, of means for varying the contact of the ductor roll with the ink drum comprising a variable speed transmission unit having a shiftable control, gearing from the ink drum to the said unit, a centrifugal governor operated by the said gearing, said governor actuating the shiftable control, gearing from the unit to the fountain roll and means for actuating the ductor roll from the fountain roll.

9. The combination with an ink drum, a fountain roll and a ductor roll therebetween, of means for varying the contact of the ductor roll with the ink drum comprising a variable speed transmission unit having a shiftable control, gearing from the ink drum to the said unit, a centrifugal governor operated by said gearing, said governor actuating the shiftable control to vary the transmitted speed inversely with the speed of the ink drum, gearing from the unit to the fountain roll and means for actuating the ductor roll from the fountain roll.

10. The combination with an ink drum, a fountain roll and a ductor roll therebetween, of means for varying the contact of the ductor roll with the ink drum comprising a variable speed transmission unit having a speed adjusting control shaft, gearing from the ink drum to the said control shaft, gearing from the unit to the fountain roll, means for actuating the ductor roll from the fountain roll, and means connected to the control shaft for varying the transmitted speed.

11. The combination with an ink drum, a fountain roll and a ductor roll therebetween, of means for varying the contact of the ductor roll with the ink drum comprising a variable speed transmission unit having a speed adjusting control shaft, gearing from the ink drum to the said control shaft, gearing from the unit to the fountain roll, means for actuating the ductor roll from the fountain roll, and manual means connected to the control shaft for varying the transmitted speed.

12. The combination with an ink drum, a fountain roll and a ductor roll therebetween, of means for varying the contact of the ductor roll with the ink drum comprising a variable speed transmission unit having a speed adjusting control shaft, gearing from the ink drum to the said control shaft, gearing from the unit to the fountain roll, means for actuating the ductor roll from the fountain roll, and automatic means connected to the control shaft for varying the transmitted speed.

13. The combination with an ink drum, a fountain roll and a ductor roll therebetween, of means for varying the contact of the ductor roll with the ink drum comprising a variable speed transmission unit having a speed adjusting control shaft, gearing from the ink drum to the said control shaft, gearing from the unit to the fountain roll, means for actuating the ductor roll from the fountain roll, and electrically operated means connected to the control shaft for varying the transmitted speed.

14. The combination with an ink drum, a fountain roll and a ductor roll therebetween,

of means for varying the contact of the ductor roll with the ink drum comprising a variable speed transmission unit, drive means connecting the ink drum to said unit for driving same, drive means connecting the unit to the fountain roll for driving said roll, means for actuating the ductor roll from the fountain roll and means for varying the ratio of speed through the said transmission unit inversely with the speed of the ink drum.

15. The combination with an ink drum, a fountain roll and a ductor roll therebetween, of means for varying the contact of the ductor roll with the ink drum comprising a variable speed transmission unit, gearing from the ink drum to the said unit, gearing from the unit to the fountain roll, means for actuating the ductor roll in proportion to the speed of the fountain roll, and means for varying the ratio of speed through the said transmission unit.

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