April 22, 1941. E. F. DUDLEY 2,239,168

DUCTOR ROLLER CONTROL

Filed June 29, 1940 2 Sheets-Sheet 1

Fig. 1.

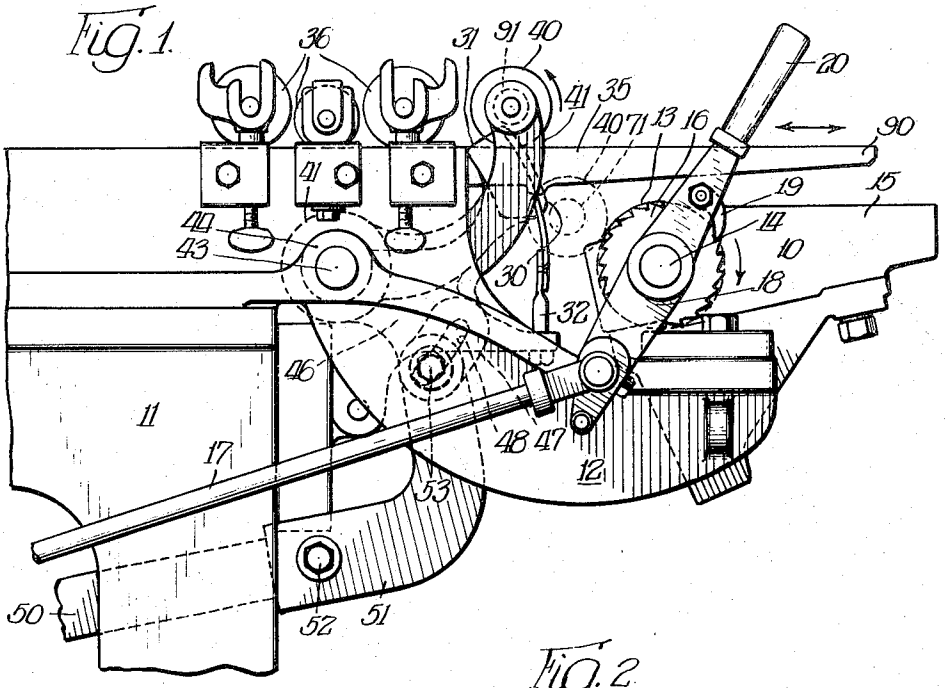
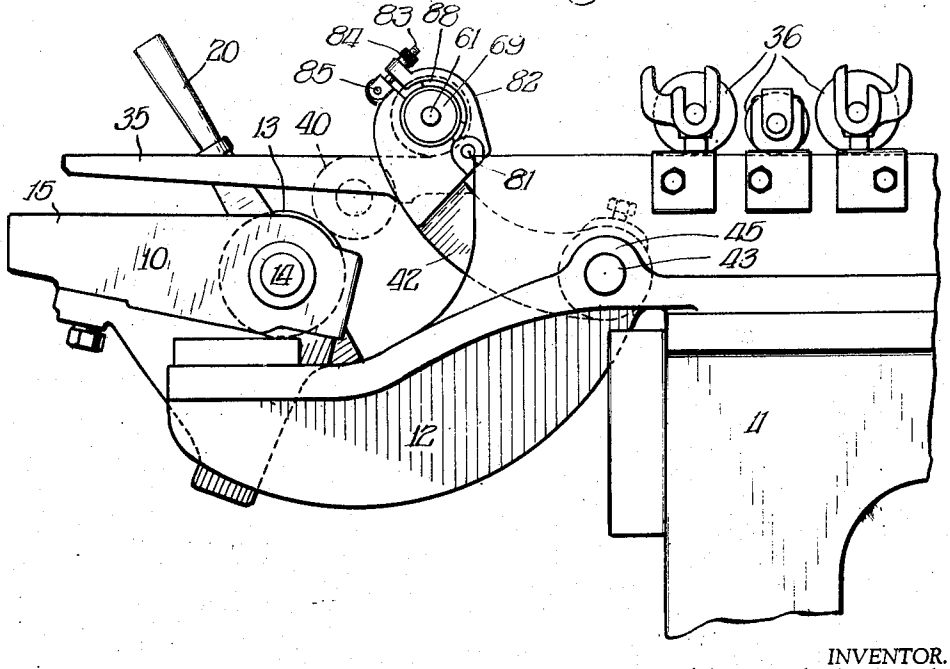


Fig. 2.



INVENTOR.
Edward F. Dudley.

BY
Wilkinson, Huxley, Byron & Knight
ATTYS.

April 22, 1941. E. F. DUDLEY 2,239,168

DUCTOR ROLLER CONTROL

Filed June 29, 1940 2 Sheets-Sheet 2

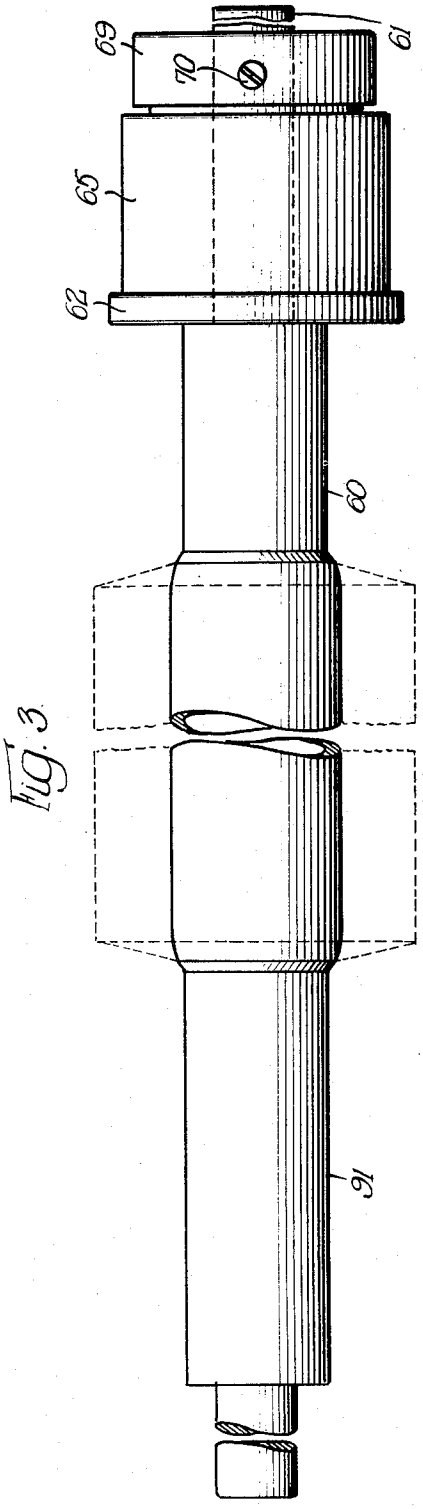


Fig. 3

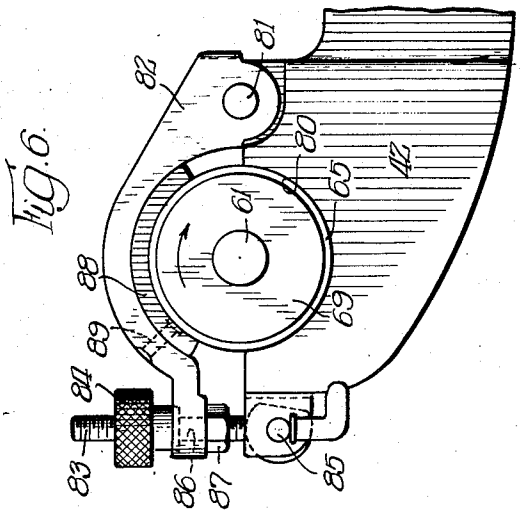


Fig. 6

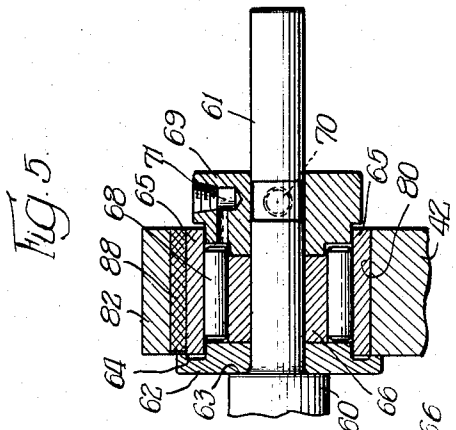


Fig. 5

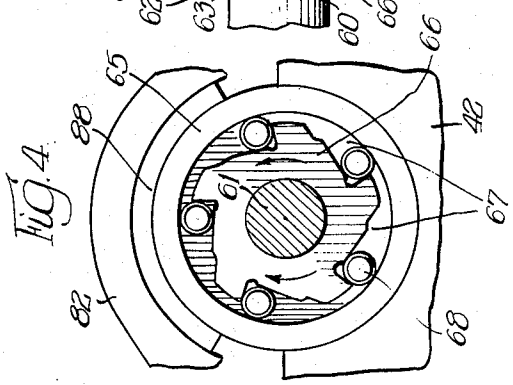


Fig. 4

INVENTOR.
Edward F. Dudley
BY
Wickinson, Hurley, Byron & Knight
attys.

Patented Apr. 22, 1941 2,239,168

UNITED STATES PATENT OFFICE

2,239,168

DUCTOR ROLLER CONTROL

Edward F. Dudley, Oak Park, Ill., assignor to Miehle Printing Press & Manufacturing Company, Chicago, Ill., a corporation of Illinois

Application June 29, 1940, Serial No. 343,111

4 Claims. (Cl. 101—344)

This invention has for its purpose the provision of improved means whereby the ductor roller of inking mechanisms on flat bed cylinder printing presses is controlled during its cycle of operation.

In such presses, the mechanism whereby ink is supplied to the printing form includes an ink fountain, a metal roller mounted in the fountain for feeding ink therefrom, commonly termed fountain roller, a reciprocating ink distributing table, distributing rollers cooperating with the latter, a composition ductor roller which oscillates between the fountain roller and the ink table in a manner to convey a supply of ink from the fountain roller to said table, and a set of form rollers which apply a thin film of distributed ink to the printing form.

In the operation of inking mechanisms of the class referred to, it occurs quite often that the ductor roller spins at the moment of its contact with the fountain roller, the direction of rotation being opposite to that in which the fountain roller is rotated for feeding ink to the ductor roller. Such a condition results in an uneven and excessive wear of the composition on the ductor roller.

A further, and perhaps even more objectionable condition arises due to the ductor roller "repeating" on the fountain roller. This is caused by the same peripheral portion of the ductor roller contacting with the fountain roller every time it receives ink therefrom. The result will be an unsatisfactory print due to the fact that said portion of the ductor roller will eventually become charged with an excess amount of ink, thereby impairing a proper distribution of the ink which clearly shows up in the finished print as "repeats" or as roller streaks.

Various schemes have been suggested and attempted heretofore with a view to overcoming defects such as I have pointed out above. For instance, the spinning motion of the ductor roller during its travel towards the fountain roller was overcome by brake means applied to the ductor roller immediately prior to its contact with the fountain roller. Other arrangements included means for imparting rotation to the ductor roller in the direction of the fountain roller just before the two rollers contacted. In other instances, brake means were applied to the ductor roller in a manner that the roller was positively held against rotation during its travel between the fountain roller and the ink distributing table and released only immediately prior to contacting said roller and table.

All of these attempts did not fully overcome said defects and therefore the desired results were not accomplished.

Extensive experimentations have proven conclusively to me that the best results are obtained when the ductor roller control includes means whereby the following combination of conditions are assured:

1. The roller should be perfectly free to spin when moving into contact with the fountain roller, it should not be under the influence of any driving means while in contact with the fountain roller;

2. The rotation of the ductor roller, initiated by its contact with the fountain roller, should be continued during its travel to the ink table so that the roller already rotates at the moment when it moves into contact with the table;

3. The ductor roller should rotate freely during the ink receiving stroke of the ink table;

4. During the return stroke of the table, however, and preferably to a point shortly before the ductor roller contacts with the fountain roller, the rotation of the ductor roller should be restrained, but not altogether prevented, thereby creating a slight slippage so that with every cycle of the ductor roller motion, its peripheral contact with the fountain roller shall change, thereby avoiding uneven wear of the ductor roller and eliminating "repeats," all of which will result in better printing quality.

It is the primary object of my invention to provide a device for controlling the ductor roller of inking mechanisms which shall provide the above conditions and which shall fully meet all of the requirements for producing a satisfactory ink distribution and improved prints.

Another object of the invention resides in the provision of mechanism which shall be simple in its construction, convenient to operate and economical to manufacture.

Further objects and advantages of the invention will be apparent from the following description and appended claims read in conjunction with the accompanying drawings which illustrate one preferred embodiment of the invention and in which:

Figure 1 represents in side elevation that part of a printing press to which my invention applies;

Figure 2 is another view in elevation of the same part but taken from the opposite side of the press;

Figure 3 is a fragmentary view of the ductor

roller in connection with which my invention is applied;

Figure 4 shows in cross section a preferred type of clutch member used to accomplish the principle of my invention;

Figure 5 is an axial cross-sectional view of the assembled clutch unit, and

Figure 6 illustrates a preferred mode of adjustably mounting the clutch unit.

Referring to Figure 1 of the drawings, the ink fountain 10 is attached to the press frame 11 in any suitable manner, such as through the intermediary of a bracket 12 which projects rearwardly from the press. The fountain roller 13 is journalled in the side walls of the fountain and the journal 14, which projects beyond the fountain wall 15, carries a ratchet wheel 16 whereby, as is well known in the art, intermittent rotation is imparted to the fountain roller from some operating part of the press, not shown, by means of a connecting rod 17, lever 18 and pawl 19, the roller 13 may also be actuated manually by means of a lever 20 which carries said pawl. On the press frame is also mounted a friction shoe 30 which is stationary and comprises one or more strips of material such as leather, secured at one end to a block 31 and at the other end to an adjustable bolt 32, so that the tension of said strip or strips may be adjusted at will.

The ink distributing table 35 is associated with the type bed of the press to slide to and fro therewith, as is customary in printing presses of the flat bed cylinder type. In order to distribute the ink over said table, a plurality of composition rollers 36, commonly referred to in the trade as "angle" rollers, are arranged to maintain contact with the ink table during the operation of the press.

The ductor roller 40 to which the principle of my invention applies, is journaled in the extreme ends of oscillating arms 41, 42, one of which is arranged at each side of the inking mechanism and secured to the cross shaft 43 which is journaled in bearings 44 and 45 respectively provided on the fountain frame bracket 12, see Figures 1 and 2. The arm 41 has a downwardly projecting extension 46 formed with a boss 47 within which is provided a longitudinal slot 48. The intermittent oscillation of the arm 41 and therewith of the ductor roller 40 is preferably accomplished by cam mechanism not shown and actuated from an operating part of the press, through a connecting rod 50 and arm 51 which latter is rigidly secured at 52 to said rod by means of a cap screw 53 to the slotted boss 47 of the arm 41.

The parts described so far constitute arrangements well-known in the construction of printing presses of the flat bed type and are merely contributory to the carrying into practice of my invention.

In Figures 3 to 6 inclusive, I have featured that part of the novel device, whereby the principle of the invention may readily be accomplished, said device being a preferred embodiment and may be substituted by any other suitable means whereby the same result can be attained.

One of the outstanding characteristic constructional features of my improved ductor roller control resides in the fact that the means whereby the control is effected is carried by the roller itself and is of utmost simplicity so that it may be readily attached to presses now in the field.

As shown in Figure 3, one of the reduced ends of the roller stock provides a spindle 61 on which is arranged a one-way clutch member. The latter includes an inner end plate 62 which bears against a shoulder 63 of the roller stock 60. Said plate is formed with an annular recess 64 which loosely receives an outer roller race 65. Rigidly secured to the spindle 61 is a ratchet star 66 of conventional design, providing wedge shaped areas 67 between the inner wall of the race 65 for freely accommodating at their widest part in each one of the areas, steel rollers 68. These areas gradually reduce in width in a direction away from the center of the star 66. Accordingly, when the roller spindle 61 and therewith the star 66 are rotated in an anti-clockwise direction, as viewed in Figure 4, the outer race will not follow such rotation, however, when said spindle rotates in a clockwise direction then the rollers 68 will become wedged between the outer race 65 and the minimized part of the areas 67 and consequently the outer race will be caused to rotate in the same direction. The clutch member is sealed by means of an annular outer wall 69 which is held in position on the spindle 61 by means of a lock screw or the like indicated at 70. The clutch unit may be conveniently lubricated through the oil duct 71.

In Figure 6 I have illustrated a preferred manner of mounting that end of the ductor roller which carries the one-way clutch.

The upper end of the arm 42 is formed with a recessed bearing portion 80 to receive the outer race 65 of the clutch unit. At 81 a bearing yoke 82 is pivoted to the arm 42 so that it can be swung over and embrace the race 65 in order to retain it within the bearing 80.

The yoke 82 is held in its position in any conventional manner such as by means of a locking bolt 83 and nut 84, the former being pivoted to the arm 42 at 85 and passes through a bore or recess 86 provided in the free end of the yoke. The extent of movement of the latter towards the complementary bearing portion of the arm 42 can be set by an adjusting nut 87 as will be readily understood. To the inner side of the yoke 82 is secured a brake lining 88 by any suitable means such as rivets 89. This brake lining is intended to bear against the outer surface of the roller race 65 in a manner that it will not altogether prevent rotation of said race but will apply sufficient pressure onto it that its rotation, and therefore the rotation of the ductor roller 40, shall be merely restrained.

In the operation of the improved device it will be understood that the oscillatory motion of the ductor roller 40 is performed in timed relation with the reciprocatory motion of the ink distributing table 35. In the position shown in Figure 1, the roller 40 is in rolling engagement with the table 90 to supply it with ink while the latter travels to the right. During that period the rotation of the roller is unrestrained because the steel rollers 68 of the one-way clutch remain free in the wide part of the wedge shaped areas 67 and therefore they do not carry along the outer race 65 of the clutch, see Figure 4. However, as soon as the rotation of the roller 40 reverses when the ink distributing table begins its return stroke, then due to the clockwise rotation of said roller and therewith of the ratchet star 66, the steel rollers 68 shall become wedged against the outer race 65 and cause the latter to follow the same direction of rotation. Because of the limited amount of friction applied to the race 65 by means of the brake lining 88, a slight slippage of the ductor roller with relation to the

surface of the table 35 will be created and as a consequence thereof the position of a given point on the periphery of the roller 40 will change correspondingly. As a result of this condition, the point of contact of the ductor and fountain rollers will change likewise, and a different peripheral portion of the ductor roller shall be presented to the fountain roller during the next cycle of operation.

When the table 35 during its stroke to the left, as viewed in Figure 1, reaches a point where the edge 90 has cleared the roller 40, then the latter commences its movement down into contact with the fountain roller to receive a fresh supply of ink. Ordinarily, during such downward movement the roller 40 will spin at a fast rate of speed, and it would hit the fountain roller 13 while spinning at such speed. Such undesirable condition is avoided by the provision of the friction shoe 30 which is adjusted so that it engages the free portion 91 of the roller stock thereby acting as a brake and stopping the rotation of the ductor roller before it contacts the fountain roller. By means of the ratchet mechanism described in conjunction with Figure 1, the fountain roller 13 is intermittently rotated in a clockwise direction during which movement a fresh supply of ink is transferred to the ductor roller 40. When the latter moves away from the fountain roller it already spins freely in an anticlockwise direction and this spinning of the roller is being maintained and in fact increased during the upward stroke of the roller due to the roller stock portion 91 riding over the friction shoe 30. Consequently when the ink distributing table 35 moves into engagement with the roller 40, the latter's rotation will be maintained and the fresh supply of ink will become transferred to the table.

The above described cycle of operation is repeated for every printing stroke of the press.

It shall be understood of course that while I have chosen to describe and illustrate a preferred embodiment of means whereby my invention may be put into practice, I intend to cover any such modification of the arrangement that will come within the interpretation of the appended claims.

I claim:

1. In inking mechanism for printing presses, having an ink fountain and fountain roller, an ink conveying ductor roller, a reciprocating ink distributing table, means for oscillating said ductor roller into and out of contact with said fountain roller and said table, and a friction member influencing the rotary motion of the ductor roller in both directions of its oscillatory movement, the combination of ductor roller controlling means, including means carried by said ductor roller and arranged to permit free rotation of the ductor roller when in contact with the fountain roller and while traveling toward and during one stroke of the reciprocatory motion of said table, and to cause restrained rotation of the ductor roller during the other stroke of the reciprocatory motion of said table, thereby creating a slight slippage of the ductor roller during such restrained rotation, for the purpose herein set forth.

2. In inking mechanism for printing presses, having an ink fountain and fountain roller, an ink conveying ductor roller, a reciprocating ink distributing table, means for oscillating said ductor roller into and out of contact with said fountain roller and said table, and a friction member influencing the rotary motion of the ductor roller in both directions of its oscillatory movement, the combination of ductor roller controlling means, including means carried by said ductor roller and arranged to permit free rotation of the ductor roller when in contact with the fountain roller and while traveling toward and during one stroke of the reciprocatory motion of said table, and to cause restrained rotation of the ductor roller during the other stroke of the reciprocatory motion of said table and during its travel toward said fountain roller, thereby creating a slight slippage of the ductor roller during such restrained rotation, for the purpose herein set forth.

3. In inking mechanism for printing presses, having an ink fountain and fountain roller, an ink conveying ductor roller, a reciprocating ink distributing table, means for oscillating said ductor roller into and out of contact with said fountain roller and said table, and an adjustable friction shoe influencing the rotary motion of the ductor roller in both directions of its oscillatory movement, the combination of ductor roller controlling means, including a one-way clutch member mounted at one end of said ductor roller and arranged to permit free rotation of the ductor roller when in contact with the fountain roller and while traveling toward and during one stroke of the reciprocatory motion of said table, and to cause restrained rotation of the ductor roller during the other stroke of the reciprocatory motion of said table and during its travel toward said fountain roller, thereby creating a slight slippage of the ductor roller during such restrained rotation, for the purpose herein set forth.

4. In inking mechanism for printing presses, having an ink fountain and fountain roller, means for intermittently rotating the latter, an ink conveying ductor roller, a reciprocating ink distributing table, means for oscillating said ductor roller into and out of contact with said fountain roller and said table, and an adjustable friction shoe secured to the press frame and influencing the rotary motion of the ductor roller in both directions of its oscillatory movement, the combination of ductor roller controlling means, including an adjustable one-way clutch member mounted at one end of said ductor roller and arranged to permit free rotation of the ductor roller when in contact with the fountain roller and while traveling toward and during one stroke of the reciprocatory motion of said table, and to cause restrained rotation of the ductor roller during the other stroke of the reciprocatory motion of said table and during its travel toward said fountain roller, thereby creating a slight slippage of the ductor roller during such restrained rotation, for the purpose herein set forth.

EDWARD F. DUDLEY.