Aug. 1, 1944. H. M. BARBER 2,354,981

INK DISTRIBUTION FOR ROTARY PRINTING PRESSES

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Fig. 1.

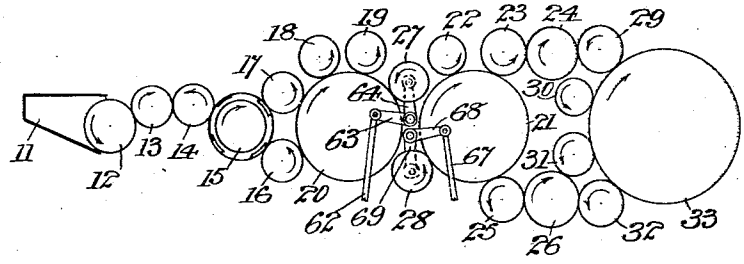


Fig. 2.

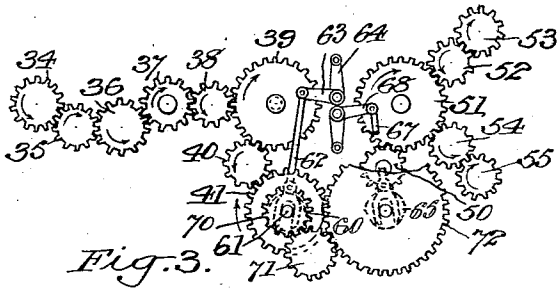


Fig. 3.

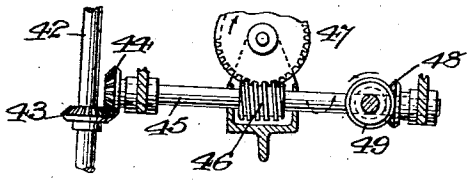


Fig. 4.

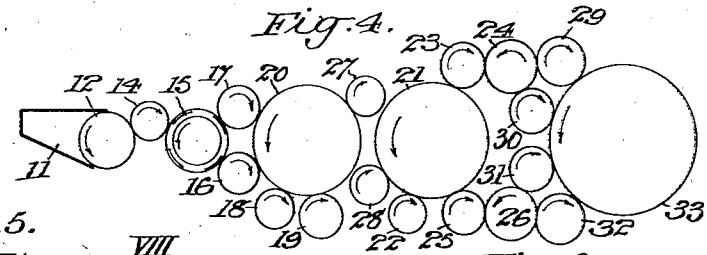


Fig. 5.

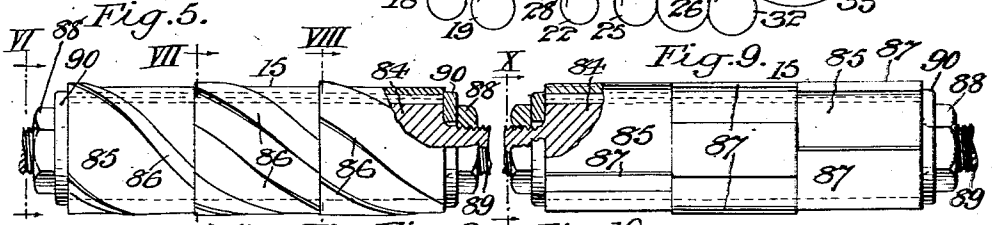


Fig. 9.

Fig. 6.

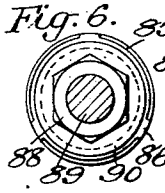


Fig. 7.

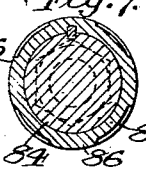
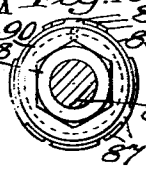


Fig. 8.



Fig. 10.



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Fig. 11.

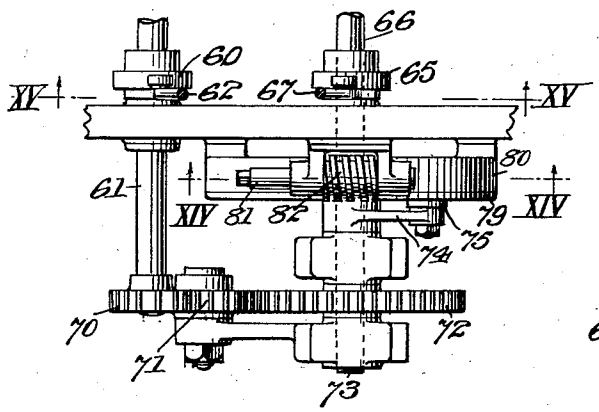


Fig. 15.

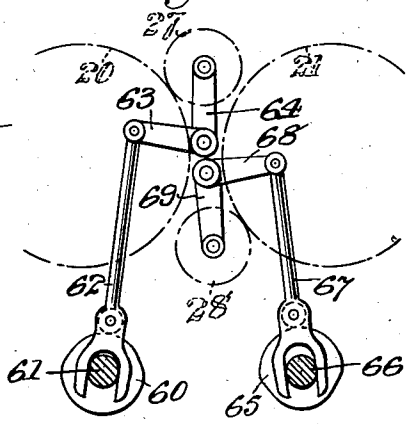


Fig. 12.

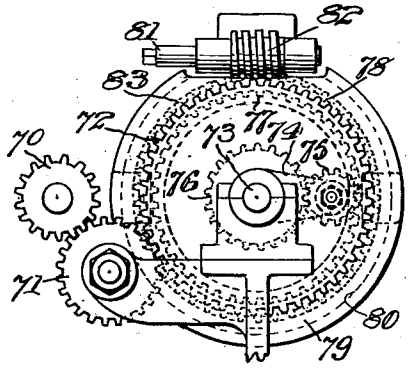


Fig. 13.

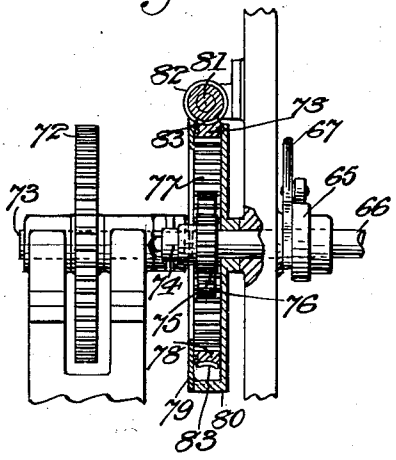
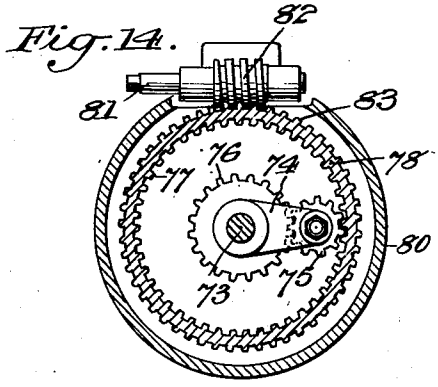


Fig. 14.



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Fig. 16.

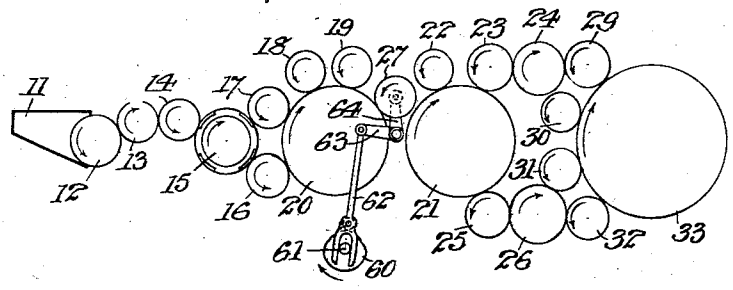


Fig. 17.

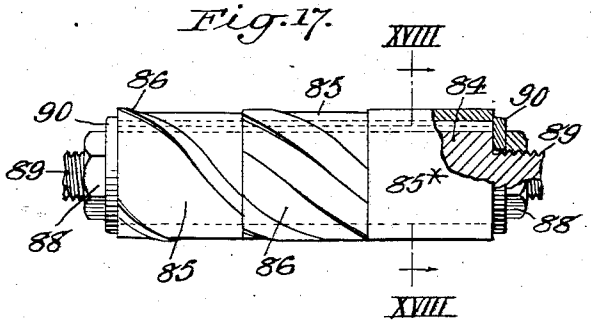


Fig. 18.

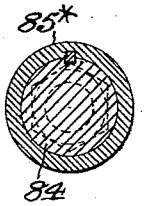
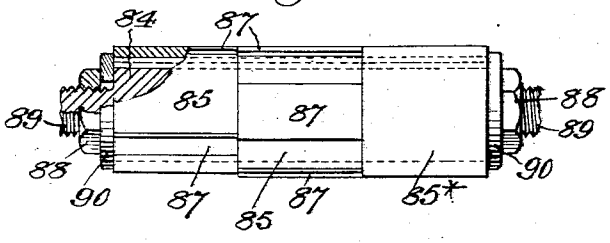


Fig. 19.



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UNITED STATES PATENT OFFICE

2,354,981

INK DISTRIBUTION FOR ROTARY PRINTING PRESSES

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Application June 11, 1942, Serial No. 446,600

16 Claims. (Cl. 101—350)

In high speed printing it is desirable that the ink should be applied in the required predetermined amounts to the printing cylinder of a rotary printing press according to the rotative speed of the printing cylinder and according to the character of the product to be printed and without changing the flow of the ink from the fountain.

The object of my invention is to provide simple and effective means in the ink distribution for ensuring the right quantity of ink to be applied along the printing cylinder, which means includes, generally, an ink transfer roller located in the low speed portion of the ink distribution, said ink transfer cylinder being provided with ink transfer surfaces of predetermined areas, some or all of which surfaces may be raised. One or two oscillating ductor rollers may be provided between the low and high speed portions of the ink distribution where two ductor rollers are provided, manually operated means being employed for changing the timing of one ductor roller with respect to the other, preferably while the press is running.

My invention includes, in an ink distribution, in one instance, a sectional ink transfer roller in which all of the sections are provided with one or more ribs having ink transfer surfaces of different areas, and, in other instances, a sectional ink transfer roller in which one or more of the sections will be provided with continuous transfer surfaces.

My invention more particularly includes, in an ink distribution, a sectional ink transfer roller comprising a cylindrical core and a plurality of sleeves removably mounted end to end thereon, all or certain of the sleeves having ribs of varying widths according to the character of the printed product arranged in different relative positions along the roller; or certain of the sleeves having continuous ink transfer surfaces, according to where greater or lesser quantities of ink are to be applied to the printing cylinder.

Practical embodiments of this invention are represented in the accompanying drawings, in which Fig. 1 represents in diagram an ink distribution which includes a sectional ink transfer roller and two independently operated ductor rollers. Fig. 2 represents the ink distribution gearing. Fig. 3 represents a detail section showing a portion of the driving means for the ink distribution. Fig. 4 represents a diagrammatic view of a slightly modified form of ink distribution. Fig. 5 represents an enlarged side elevation, partly in section, of one form of ink transfer roller. Fig. 6 represents a cross section taken in the plane of the line VI—VI of Fig. 5. Fig. 7 represents a cross section taken in the plane of the line VII—VII of Fig. 5. Fig. 8 represents a cross section taken in the plane of the line VIII—VIII of Fig. 5. Fig. 9 represents a side view, partly in section, of a modified form of ink transfer roller. Fig. 10 represents a cross section taken in the plane of the line X—X of Fig. 9. Fig. 11 represents an enlarged detail plan view of the means for controlling the timing of one of the ductor roller operating cams with respect to the other ductor roller operating cam. Fig. 12 represents a detail side view of the same. Fig. 13 represents a detail end view of the same. Fig. 14 represents a detail section taken in the plane of the line XIV—XIV of Fig. 11. Fig. 15 represents a cross section taken in the plane of the line XV—XV of Fig. 11. Fig. 16 represents in diagram an ink distribution which includes a single ductor roller which oscillates between the low and high speed ink cylinders of the distribution. Fig. 17 represents an enlarged side elevation of another form of sectional ink transfer roller in which two of the sections are shown as having spiral ribs of different areas and a third section as having a continuous transfer surface. Fig. 18 represents a cross section taken in the plane of the line XVIII—XVIII of Fig. 17. Fig. 19 represents in side elevation still another form of sectional ink transfer roller in which two of the sections are shown as having straight ribs provided with ink transfer surfaces of different areas and a third section as having a continuous transfer surface.

The ink fountain of the distribution is denoted by 11. The slow speed portion of the ink distribution is shown as comprising the ink fountain roll 12, the rollers 13, 14, the ink transfer roller 15, the rollers 16, 17, 18, 19 and the ink cylinder 20. The high speed portion of the distribution is shown as comprising the ink cylinder 21 and the rollers 22, 23, 24, 25 and 26. The two independently operated ductor rollers 27, 28, illustrated in Figs. 1 and 4, oscillate between the slow speed ink cylinder 20 and the high speed ink cylinder 21. The form inking rollers are denoted by 29, 30, 31, 32 and their form or printing cylinder is denoted by 33. The slow speed portion of the ink distribution is shown as including the gears 34 to 41 inclusive which are driven from the vertical drive shaft 42 through the bevel gears 43, 44, horizontal shaft 45 and worm gears 46, 47. The high speed

portion of the ink distribution is shown as including the bevel gears 48, 49 and the spur gears 50, 51, 52, 53, 54, 55.

The means for oscillating the ductor roller 27 between the slow and high speed ink cylinders 20 and 21 is shown as including a cam 60 on the shaft 61, which cam reciprocates the forked rod 62 connected to one arm of the rock lever 63, 64. The means for independently oscillating the ductor roller 28 between the slow and high speed ink cylinders 20 and 21 is shown as a cam 65 on the shaft 66, which cam reciprocates the forked rod 67 connected to one arm of the rock lever 68, 69.

The shaft 66 of the cam 65 is driven from the shaft 61 of the cam 60 through a planetary gearing as follows. A spur gear 70 on the shaft 61 meshes with a gear 71 which in turn meshes with a gear 72 on a short shaft 73 located in alinement with the cam shaft 66. The shaft 73 has an arm 74 provided with a pinion 75 which meshes with a spur gear 76 on the cam shaft 66 and also with the internal teeth 77 of a ring 78 carried by the end plate 79 of the housing 80.

The means for varying the timing of the ductor roller 28 with respect to the ductor roller 27 to regulate the amount of ink transferred from the low speed ink cylinder 20 to the high speed ink cylinder 21 is illustrated in Figs. 11 to 15 inclusive and is shown as comprising the following elements. A hand shaft 81 is provided with a worm 82 which meshes with the external teeth 83 of the said ring 78. This shaft 81 may be turned in either direction by a suitable tool, not shown, for advancing or retarding the shaft 66 which carries the cam 65.

In certain instances only one ductor roller between the low and high speed ink cylinders may be used in combination with the new form of ink transfer roller. This may be accomplished by omitting either the ductor roller 27 or 28. In Fig. 16 I have shown the ductor roller 28 as being omitted.

The sectional ink transfer rollers may be provided with raised and continuous ink transfer surfaces of predetermined areas so as to transfer different predetermined amounts of ink in the ink distribution. These ink transfer rollers may be made in various forms. In Fig. 5 I have shown the sectional roller as comprising a cylindrical core 84 on which three sleeves 85 are removably mounted end to end in the desired relationship. These sleeves 85 are provided with annular series of spiral ribs 86 of different predetermined widths varying from a quite narrow width to a quite wide width. In Fig. 9 the sleeves 85 are provided with annular series of straight ribs 87 of different predetermined widths. In Fig. 17 the sectional ink transfer roller is shown as comprising two sleeves 85 provided with annular series of spiral ribs having their ink transfer surfaces of different predetermined widths and a third sleeve 85* having a continuous transfer surface. In Fig. 19 the sectional ink transfer roller is shown as comprising the two sleeves 85 provided with annular series of straight ribs having their ink transfer surfaces of different predetermined widths and a third sleeve 85* having a continuous ink transfer surface.

It is to be understood that the sleeves on these ink transfer rollers may be arranged in any predetermined relationship to ensure the proper distribution of ink according to the printing requirements. These sleeves may be keyed to the core to prevent circumferential displacement thereon.

The means which I have shown for preventing endwise displacement of the sleeves is shown as comprising nuts 88 threaded on the roller shafts 89, overlapping collars 90 being located between the nuts and the sleeves.

In the embodiment shown in Fig. 4 where the printing cylinder 33 rotates in the opposite direction from that shown in Fig. 1, the inking roller 13 and the gear 35 may be omitted and the rollers 18, 19 and 22 are also shifted to the undersides of the ink drum 20 and the ink cylinder 23 respectively.

By the use of the ink transfer rollers constructed as hereinabove set forth for regulating the supply of ink between very wide limits independently of the ink fountain supply, I am enabled to obtain in high speed presses a very superior grade of printing. This result is furthered in high speed presses by the relative timing of the two independently oscillated ductor rollers which permits the second ductor roller to either operate against a surface portion of the ink cylinder 20 from which the ink has been removed by the first ductor roller, or can be timed so that a portion of its dwell will be against the so-called bare part of the cylinder and the balance against the surface carrying the full supply of ink, or so that its entire dwell will be on the surface of the ink cylinder having the full supply of ink.

The transfer rollers shown and described but not claimed per se herein form the subject matter of my divisional application filed June 12, 1943, Serial No. 490,562.

It is evident that various changes may be resorted to in the construction, form and arrangement of the several parts without departing from the spirit and scope of my invention, and hence I do not intend to be limited to the particular embodiments herein shown and described, but what I claim is:

1. In an ink distribution for rotary printing presses, two ink cylinders, two ductor rollers, means for independently oscillating them between the said ink cylinders, and manually operated means for shifting the timing of one ductor roller with respect to the other ductor roller, to cause said first named ductor roller to contact with a bare surface or a partly bare and partly inked surface or a wholly inked surface of one of said ink cylinders.

2. In an ink distribution for rotary printing presses, two ink cylinders, two ductor rollers, means for independently oscillating them between the said ink cylinders, and manually operated means, operable while the press is running, for shifting the timing of one ductor roller with respect to the other ductor roller, to cause said first named ductor roller to contact with a bare surface or a partly bare and partly inked surface or a wholly inked surface of one of said ink cylinders.

3. In an ink distribution for rotary printing presses, two ink cylinders, two ductor rollers, two cams for independently oscillating them between the said ink cylinders, and manually operated means for shifting the position of one cam rotatively with respect to the other cam to change the timing of one ductor roller with respect to the other ductor roller, to cause said first named ductor roller to contact with a bare surface or a partly bare and partly inked surface or a wholly inked surface of one of said ink cylinders.

4. In an ink distribution for rotary printing presses, two ink cylinders, two ductor rollers, two cams for independently oscillating them between the said ink cylinders, and manually operated means, operable while the press is running, for shifting the position of one cam rotatively with respect to the other cam to change the timing of one ductor roller with respect to the other ductor roller to cause said first named ductor roller to contact with a bare surface or a partly bare and partly inked surface or a wholly inked surface of one of said ink cylinders.

5. In an ink distribution for rotary printing presses, low and high speed ink cylinders, two ductor rollers, means for independently oscillating them between said ink cylinders, and manually operated means for shifting the timing of one ductor roller with respect to the other ductor roller to cause said first named ductor roller to contact with a bare surface or a partly bare and partly inked surface or a wholly inked surface of said low speed ink cylinder.

6. In an ink distribution for rotary printing presses, low and high speed ink cylinders, two ductor rollers, means for independently oscillating them between said ink cylinders, and manually operated means, operable while the press is running, for shifting the timing of one ductor roller with respect to the other ductor roller to cause said first named ductor roller to contact with a bare surface or a partly bare and partly inked surface or a wholly inked surface of said low speed ink cylinder.

7. In an ink distribution for rotary printing presses, low and high speed ink cylinders, first and second ductor rollers, means for oscillating the first ductor roller between said low and high speed portions, means for independently oscillating the second ductor roller between the high and low speed portions, and manually operated means for varying the timing of the second ductor roller with respect to the first ductor roller whereby the second ductor roller is caused to contact with a bare surface or a partly bare and partly inked surface or a wholly inked surface of one of said ink cylinders.

8. In an ink distribution for rotary printing presses, low and high speed ink cylinders, first and second ductor rollers, means for oscillating the first ductor roller between said low and high speed portions, means for independently oscillating the second ductor roller between the high and low speed portions, and manually operated means, operable while the press is running, for varying the timing of the second ductor roller with respect to the first ductor roller whereby the second ductor roller is caused to contact with a bare surface or a partly bare and partly inked surface or a wholly inked surface of one of said ink cylinders.

9. In an ink distribution for rotary printing presses, low and high speed ink cylinders, first and second ductor rollers, means for oscillating the first ductor roller between said low and high speed portions, means comprising a planetary gearing driven by said first named means for independently oscillating the second ductor roller between the low and high speed portions, and manually operated means for varying the timing of the second ductor roller with respect to the first ductor roller whereby the second ductor roller is caused to contact with a bare surface or a partly bare and partly inked surface or a wholly inked surface of one of said ink cylinders.

10. In an ink distribution for rotary printing presses, low and high speed ink cylinders, first and second ductor rollers, means for oscillating the first ductor roller between said low and high speed portions, means comprising a planetary gearing driven by said first named means for independently oscillating the second ductor roller between the low and high speed portions, and manually operated means, operable while the press is running, for varying the timing of the second ductor roller with respect to the first ductor roller whereby the second ductor roller is caused to contact with a bare surface or a partly bare and partly inked surface or a wholly inked surface of one of said ink cylinders.

11. In an ink distribution for rotary printing presses, low and high speed ink cylinders, first and second ductor rollers, means for oscillating the first ductor roller between said low and high speed portions, means comprising a planetary gearing driven by said first named means for independently oscillating the second ductor roller between the low and high speed portions, and manually operated means for varying the timing of the second ductor roller with respect to the first ductor roller, comprising a hand shaft provided with a worm and gear connection with said planetary gearing whereby the second ductor roller is caused to contact with a bare surface or a partly bare and partly inked surface or a wholly inked surface of one of said ink cylinders.

12. In an ink distribution for rotary printing presses, low and high speed ink cylinders, first and second ductor rollers, means for oscillating the first ductor roller between said low and high speed portions, means comprising a planetary gearing driven by said first named means for independently oscillating the second ductor roller between the low and high speed portions, and manually operated means, operable while the press is running, for varying the timing of the second ductor roller with respect to the first ductor roller, comprising a hand shaft provided with a worm and gear connection with said planetary gearing whereby the second ductor roller is caused to contact with a bare surface or a partly bare and partly inked surface or a wholly inked surface of one of said ink cylinders.

13. In an ink distribution for rotary printing presses, low and high speed ink cylinders, first and second ductor rollers, means including a rotary cam shaft and its cam for oscillating the first ductor roller between said low and high speed portions, means including a rotary cam shaft and its cam for independently oscillating the second ductor roller between the low and high speed portions, a planetary gearing driven by said first named cam shaft and driving the second named cam shaft, and manually operated means acting on the planetary gearing for varying the timing of the second ductor roller with respect to the first ductor roller whereby the second ductor roller is caused to contact with a bare surface or a partly bare and partly inked surface or a wholly inked surface of one of said inked cylinders.

14. In an ink distribution for rotary printing presses, low and high speed ink cylinders, first and second ductor rollers, means including a rotary cam shaft and its cam for oscillating the first ductor roller between said low and high speed portions, means including a rotary cam shaft and its cam for independently oscillating the second ductor roller between the low and high speed portions, a planetary gearing driven by said first named cam shaft and driving the