

May 22, 1945.

T. E. PIAZZE

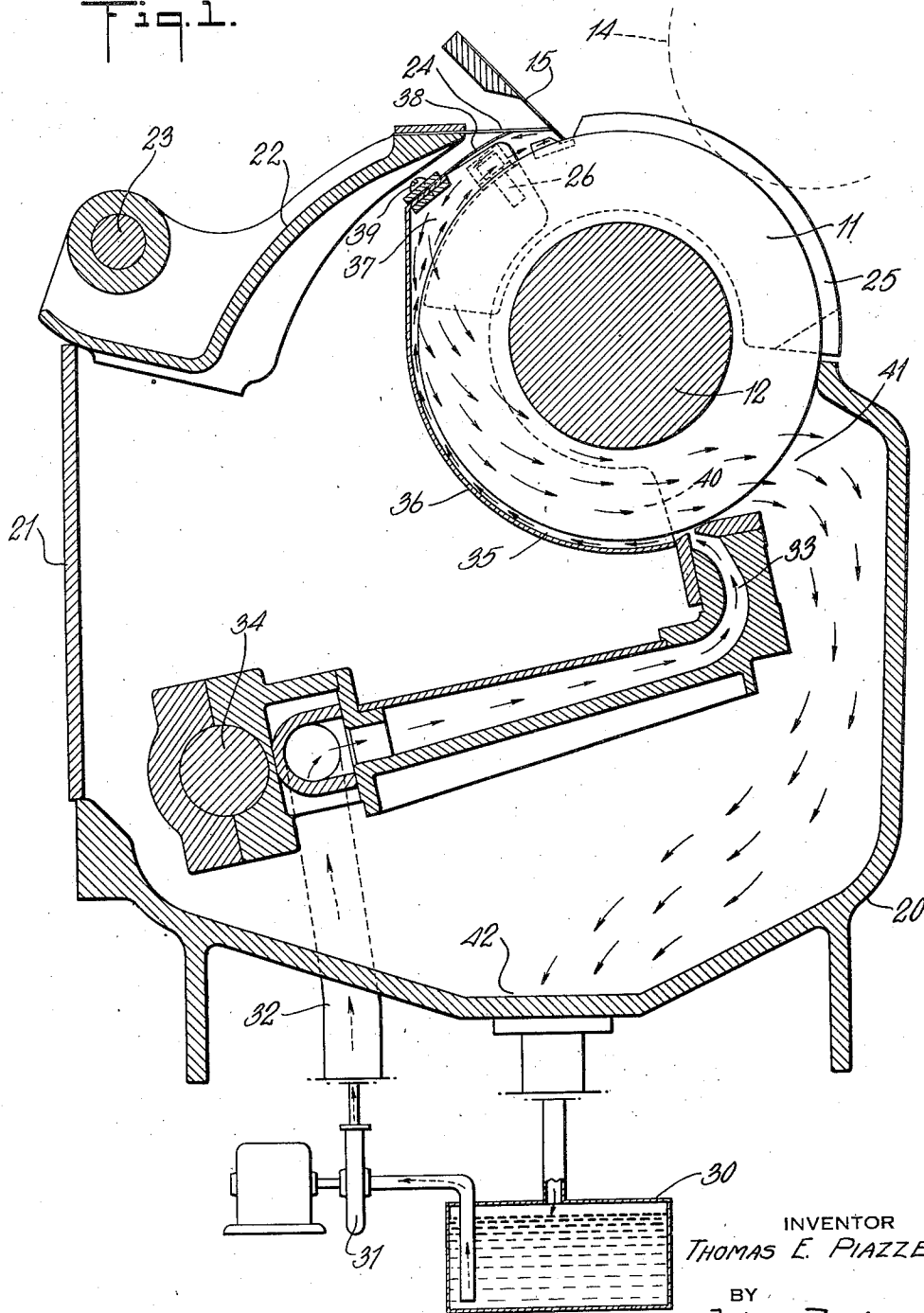
2,376,620

INKING MECHANISM

Filed Sept. 26, 1942

2 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

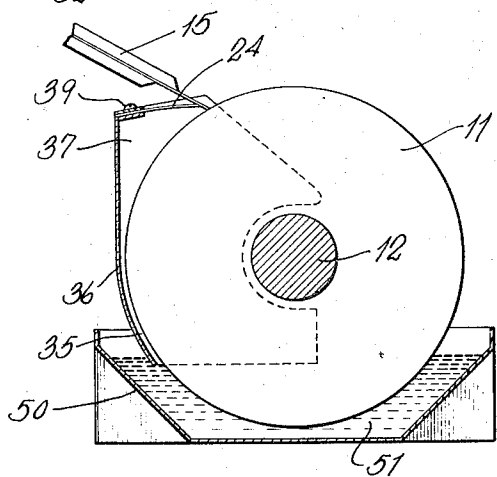
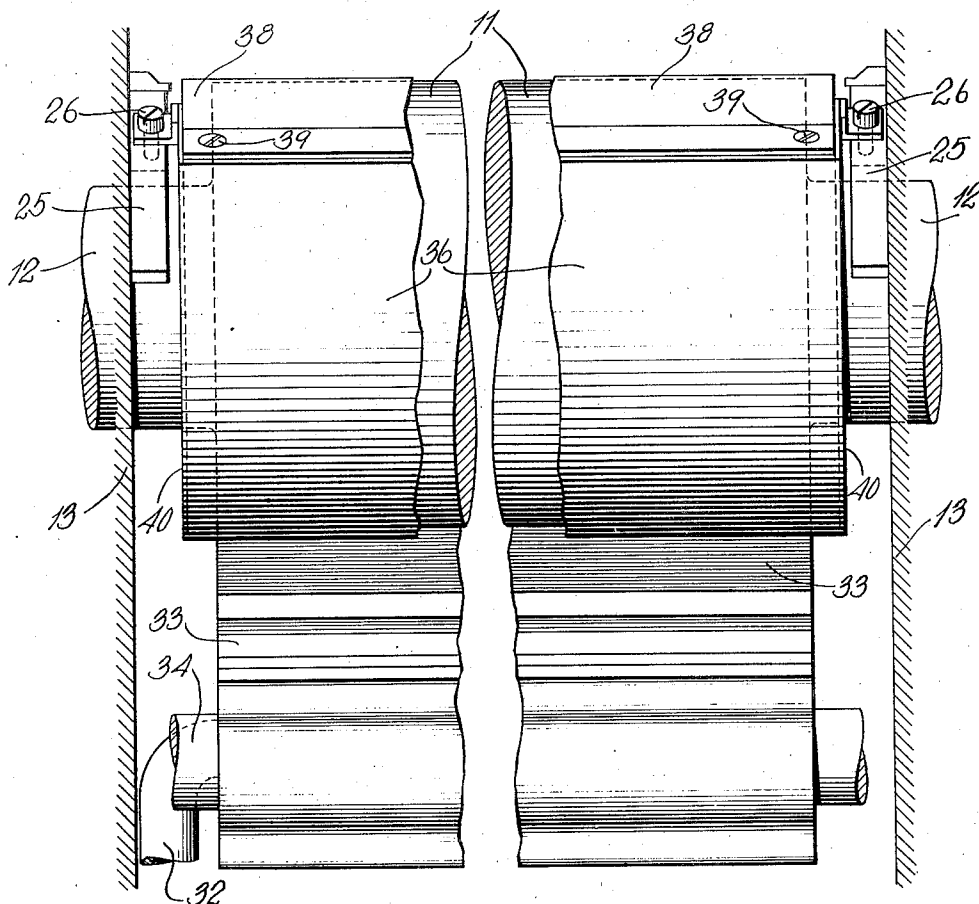


Fig. 3.

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INKING MECHANISM

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York

Application September 26, 1942, Serial No. 459,757

7 Claims. (Cl. 101—157)

This invention relates to the art of high speed rotary intaglio printing, and aims to provide an improved means of inking the plate cylinders of high speed rotary intaglio printing presses.

In the early rotary intaglio (rotogravure) printing presses, the plate cylinder merely revolved in an open bath of ink; the cylinder picked up the ink, which filled the engraved cells of the cylinder, and the excess was wiped off with a conventional reciprocating doctor blade. With the introduction of higher speed presses, made possible by the use of a closed fountain, such inking systems were found unsatisfactory; at high speeds, the ink would not fill the engraving uniformly, and poor printing resulted. This problem was attacked by the use of pumps, which forced the ink into the engraving with considerable pressure. However, this solution has met with its own difficulties. If a continuous open slot is used to discharge the ink against the cylinder, very high pump pressures must be used to fill the engravings. These high pressures are uneconomical, and act unfavorably on the ink. If the ink is merely pumped through a series of spaced openings, the lateral spread of the ink is uneven, cells are stripped, and poor printing often results.

I have now discovered a means for ink distribution for high speed rotary intaglio printing presses which overcomes these difficulties. In my apparatus, ink is pumped into contact with an engraved cylinder at a relatively low pressure, is maintained in pressure contact with the cylinder for at least one quarter of its circumference, and the excess is doctored off while the pressure is maintained. The maintenance of the pressure is effected by the use of a shell of the same general curvature as the engraved cylinder, maintained at a very slight distance (of the order of $\frac{1}{8}$ "') from the engraved cylinder, flaring out just before doctoring to permit of escape of excess ink.

The invention can be best understood by referring to the drawings, in which—

Fig. 1 is a somewhat diagrammatic section through my device, and

Fig. 2 is an elevation, with some of the parts and most of the housing, cut away.

Fig. 3 is a somewhat diagrammatic view through an alternate form of the device.

I have shown my invention embodied in a rotogravure printing press of the general type disclosed in Paardecamp Patent No. 2,278,138, issued March 31, 1942, to which reference may be made for a more complete description of such a printing press. It will be understood, however, that the invention is not restricted in its use to such a

press, but may be used in rotogravure printing presses generally.

As can be seen from the drawings, a conventional rotogravure cylinder 11 is mounted on a shaft 12, which is journaled in bearings in side frames 13 of a press. It prints by cooperation with an impression cylinder, indicated at 14.

The engraved cylinder is enclosed, in conventional fashion for high speed units, by a housing consisting of a main portion 20, a rear plate 21, and a swinging top section 22, pivoted at 23 to permit of easy access to the cylinder. A spring portion 24 contacts the edge of a standard reciprocating doctor blade 15 to complete the closure, and end seals 25, held in place by screws 26, complete the housing, together with the side frames 13.

The inking mechanism comprises a reservoir 30 from which ink is pumped by means of a pump 31 through a flexible pipe 32 into a manifold 33, from whence it is discharged into contact with the engraving. The manifold is mounted on a pivot 34 to make it adjustable as engraved cylinders of different size are used. The ink is discharged through a series of ports into the opening 35 between the engraved cylinder and a shell, 36, of metal. This shell is curved for about one quarter of the circumference of the engraving; just below the doctor blade it straightens out, to form a chamber 37. The shell 36 is connected to the top 24 of the housing, by means of a self-sealing flexible plate 38 of spring metal, detachably attached to the shell by bolts 39.

As will be noted from the drawings, the shell 36 overlaps the engraving 11, leaving a gap which is closed at the top and top front by the end seals 25, and at the rear and rear bottom by side plates 40 integral with the shell 36. Only at the front bottom is there provided an opening 41, which opens into the main housing; at the bottom a sump 42 connects with the ink reservoir 30.

In the operation of my device, ink is pumped through the manifold 33 into the compartment 35, under a rather low pressure. The compartment 35 is about $\frac{1}{8}$ " in cross-section; the pressure forces the ink across the width of the engraving, and into the cells thereof, so that the cells of the engraving are filled under uniform pressure. The film of ink is carried to the doctor blade, from whence it is forced into the chamber 37; when this chamber is filled, the ink escapes into the space between the ends of the cylinder and the side plate 40, is forced downward through the opening 41, and goes back into the reservoir 55 through the sump 42.

If, in the building of my device, the space between the point of ink application and the point of doctoring is less than about one-quarter of the total circumference of the engraved cylinder, I have found that uneven inking will take place during high speed printing, of the order of 24,000 feet per hour, and higher.

Instead of applying the ink under pressure in a closed fountain as described above, the pressure can be self-induced by the doctoring action, as shown in Fig. 3. Here, a fountain 50 is provided carrying a body of ink 51, in which the engraved cylinder 11 rotates. The ink is picked up by the cylinder, and is carried by it into the compartment 35 between the shell 36 and the cylinder. The pressure in the compartment 35 and the chamber 37 is built up by the back pressure of excess ink doctored off by the doctor blade. In this construction, the side plate 40 is preferably built to overlap the shaft 12, as indicated in the drawings, in order to provide a partial enclosure. This construction has a slight disadvantage as compared to the preferred construction, in that it requires several revolutions to build up pressure, so that the first several signatures may show signs of poor printing. This is not serious, however, since it generally requires some time to get to speed in most presses, and the first signatures are rarely satisfactory.

Obviously, modifications can be made in the above illustrative embodiment of my invention, without departing from the scope thereof, which is set forth in the claims.

I claim:

1. In a rotary intaglio printing press, a printing cylinder, means for applying ink to a point on the circumference thereof, spaced from the point of doctoring for at least one-quarter of the circumference thereof, and means for maintaining pressure between the point of application and the point of doctoring, said means comprising a shell of the same general curvature as the cylinder, and spaced therefrom by a small fraction of an inch.

2. In a rotary intaglio printing press, a printing cylinder, means for applying ink under pressure to a point on the circumference thereof, spaced from the point of doctoring for at least one-quarter of the circumference thereof, and means for maintaining said pressure between the point of application and the point of doctoring, said means comprising a shell of the same general curvature as the cylinder, and spaced therefrom by a small fraction of an inch.

3. In a rotary intaglio printing press, a print-

ing cylinder, means for applying ink under pressure to a point on the circumference thereof, spaced from the point of doctoring for at least one-quarter of the circumference thereof, and means for maintaining said pressure between the point of application and the point of doctoring, said means comprising a shell of the same general curvature as the cylinder, and spaced therefrom by a small fraction of an inch, the shell being further spaced from the cylinder at the point of doctoring to provide a chamber to permit of free drainage of excess ink over the end of the cylinder.

4. In a rotary intaglio printing press, a printing cylinder revoluble in an ink fountain, means for applying ink to a point on the circumference thereof, spaced from the point of doctoring for at least one-quarter of the circumference thereof, and means for maintaining pressure between the point of application and the point of doctoring, said means comprising a shell of the same general curvature as the cylinder, spaced therefrom by a small fraction of an inch, and covering at least one-quarter of the circumference of the cylinder, said shell being placed between the point of application and the point of doctoring.

5. In a rotary intaglio printing press, a printing cylinder revoluble in an ink fountain, means for applying ink to a point on the circumference thereof, spaced from the point of doctoring for at least one-quarter of the circumference thereof, and means for maintaining pressure between the point of application and the point of doctoring, said means comprising a shell of the same general curvature as the cylinder, spaced therefrom by a small fraction of an inch, and covering at least one-quarter of the circumference of the cylinder, said shell being placed between the point of application and the point of doctoring, the shell being further spaced from the cylinder at the point of doctoring to provide a chamber to permit of free drainage of excess ink over the end of the cylinder.

6. The rotary intaglio printing press of claim 1 in which the said shell is also spaced from the cylinder to provide a return path for the return flow of excess ink.

7. The rotary intaglio printing press of claim 1 in which the shell is further spaced from the cylinder at the point of doctoring to provide a chamber thereat, and is spaced from the cylinder at at least one end thereof to provide a return path for the drainage of excess ink.

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