

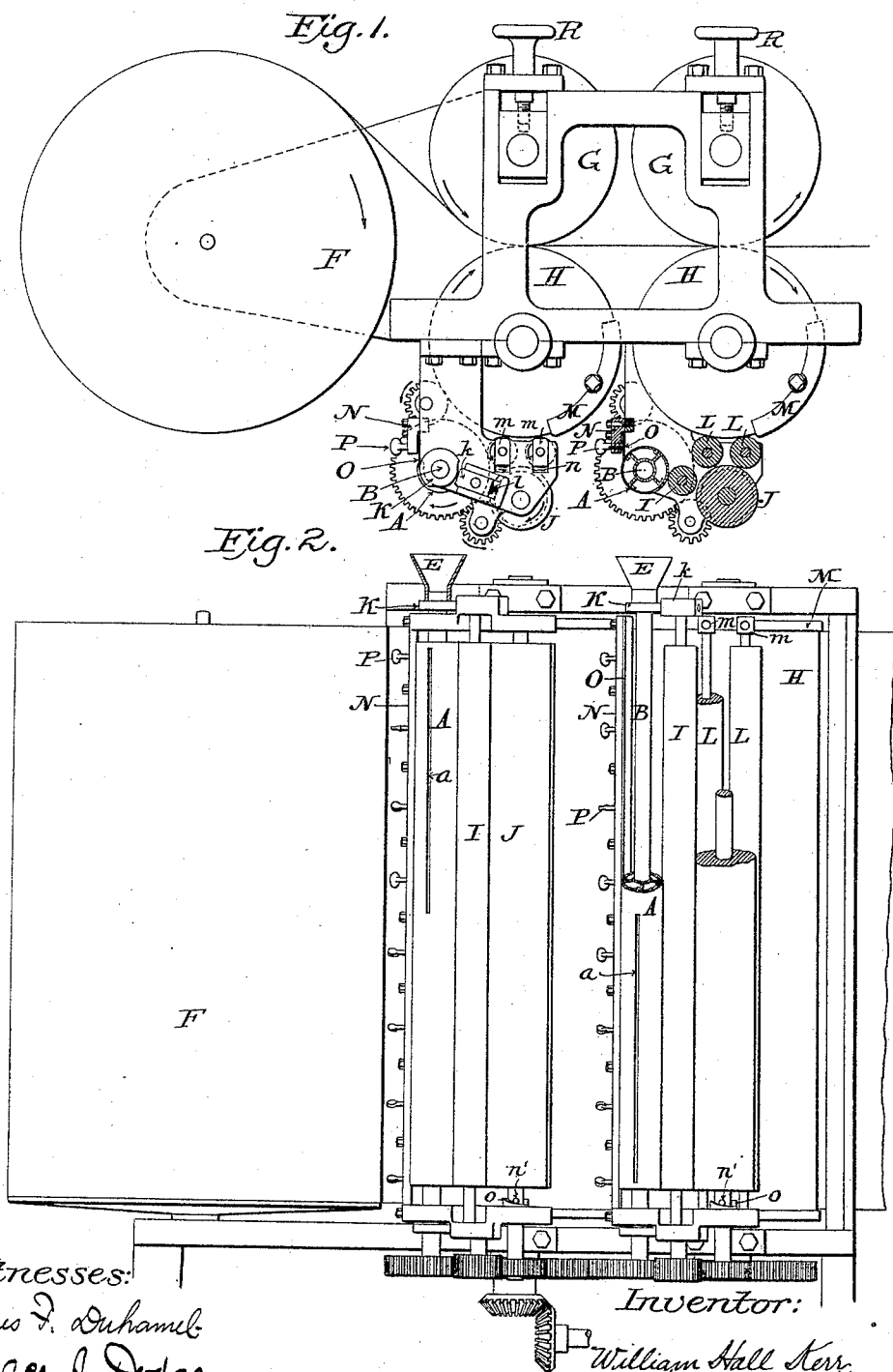
(No Model.)

2 Sheets—Sheet 1.

W. H. KERR.
PRINTING APPARATUS.

No. 443,050.

Patented Dec. 16, 1890.



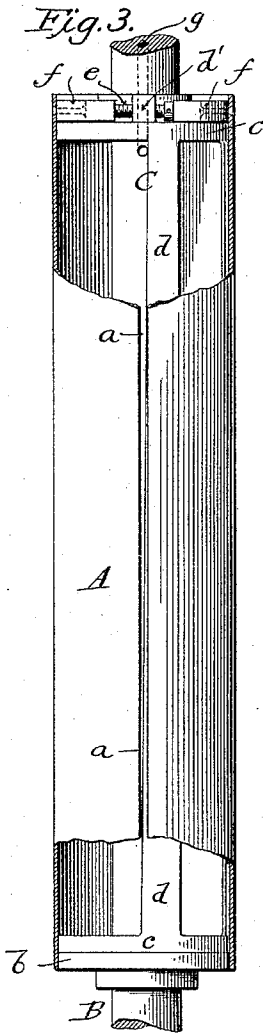
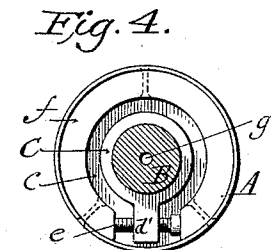
Witnesses:
James F. Duhamel
Horace A. Dodge.

Inventor:
William Hall Kerr,
by Dodge & Sons,
His Atty

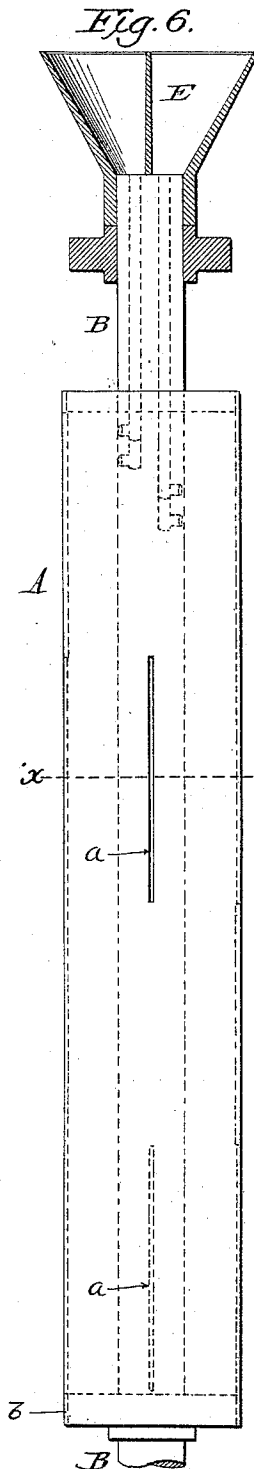
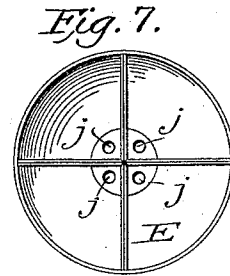
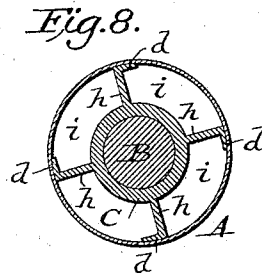
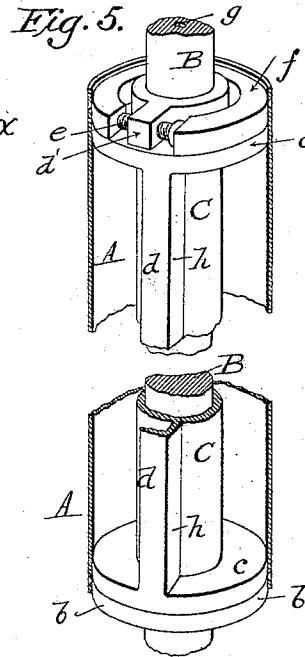
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UNITED STATES PATENT OFFICE.

WILLIAM HALL KERR, OF CONCORD, NORTH CAROLINA, ASSIGNOR, BY
DIRECT AND MESNE ASSIGNMENTS, TO THE KERR BAG MANUFACTURING COMPANY, OF SAME PLACE.

PRINTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 443,050, dated December 16, 1890.

Application filed January 31, 1890. Serial No. 333,719. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HALL KERR, a citizen of the United States, residing at Concord, in the county of Cabarrus and State of North Carolina, have invented certain new and useful Improvements in Printing Apparatus, of which the following is a specification.

My invention relates to printing mechanism, and has special reference to the inking apparatus.

The invention is particularly designed for use in connection with bag-making machinery, and is designed to occupy a vertical position—that is to say, the ink-reservoir, the distributing-rollers, and the printing-rollers are intended to have their axes arranged vertically. I do not, however, mean to restrict myself either as to the use made of the apparatus or as to the position in which it shall be used, but mention these facts by way of explaining the somewhat unusual position of parts indicated in the drawings and set forth in the following description.

In the accompanying drawings, Figure 1 is a top plan view, partially in section, of my printing and inking apparatus; Fig. 2, a side elevation, also partially in section; Fig. 3, a side elevation of the ink-reservoir in its preferred form, portions being broken away to show the internal parts; Fig. 4, a top plan view of the same; Fig. 5, a perspective view designed to better illustrate the construction of the ink-reservoir; Fig. 6, a side elevation and partial section of a modified form of ink-reservoir designed to contain ink of different colors; Fig. 7, a top plan view of the same, and Fig. 8 a cross-section on the line $x x$ of Fig. 5.

In the particular class of work for which this apparatus is specially designed it is found expedient to place the roll of bag material with its axis in a vertical plane, and it is desirable to print upon said material as it passes from the stock-roll to the mechanism which converts it into bags. For this reason the apparatus is designed with special reference to its being employed in a vertical or upright position.

It will readily be understood that if print-

ing-ink of ordinary consistency be placed in a reservoir of any form occupying an upright position the tendency to flow out therefrom will increase as the lower end of the reservoir is approached and in direct proportion to the superincumbent body of ink and consequent pressure. To counteract this tendency and insure a perfectly-uniform escape of ink from the reservoir at all points between its upper and lower end, I adopt the construction best shown in Figs. 1 and 2, in which A indicates a hollow cylinder or shell advisedly made of sheet metal, and having one or more narrow longitudinal slits or openings a in one side from a point near its upper to a point near its lower end. The lower end, and if need be the upper end also, is closed by a suitable head b .

B indicates a longitudinal central shaft passing through the shell or cylinder A from end to end and journaled at its upper and lower extremities in the frame-work of the machine.

Within the shell or cylinder A is a cut-off frame C, comprising circular heads c and one or more longitudinal connecting-bars d , as indicated in Figs. 3 and 5. The connecting-bar d , or one of said bars, if more than one be used, is made with one edge slightly oblique to or out of line with the edges of the longitudinal slit or opening a , as shown in Fig. 3, so that by bringing the bar d into such position that it shall close or nearly close the slit or opening a at the lower end of the shell or cylinder A it shall leave a constantly-widening opening from said lower end to the upper end, as shown in said figure, thereby affording an outlet for the ink varying in width in the same proportion that the pressure upon the ink varies.

The precise angle or inclination of the bar d relatively to the opening a cannot be stated, as it will vary according to the length of the cylinder or reservoir, the width of the opening, the character of the ink employed, and like circumstances or conditions; but the divergence will in any event be slight. Manifestly the same effect may be produced by making the slit or opening oblique and the bar d straight or parallel with the axis of the

reservoir, or both may be made oblique, but in reverse directions or in different degrees. In order to vary the width of the opening through which the ink escapes, but at the same time to maintain a definite decrease in its width from the upper toward the lower end under all adjustments, the upper head *c* of the cut-off frame *C* is provided with a lug *d'*, which is tapped to receive an adjusting-screw *e*, the ends of which bear against the ends of a collar *f*, bolted or otherwise secured in the upper end of the shell or cylinder *A* and filling the circle of said cylinder, with the exception of the space occupied by the screw. From this arrangement it will readily be seen that upon turning the screw, which, by reason of its bearing between the ends of the collar *f*, is itself unable to move longitudinally, the boss *d'* will be moved forward or backward, and thereby cause the cut-off frame *C* to rotate or move within the shell or cylinder *A* and relatively to the slit or opening *a*.

The heads *b* and *c* are bored out to permit the passage through them of the shaft *B*, and the head *b* is made fast both to the shell or cylinder *A* and to the shaft *B*, so that both parts are rotated as one. The upper end of the shaft *B* is provided with an opening or passage *g*, through which ink may be supplied to the interior of the reservoir, shell, or cylinder *A*.

In the class of work for which this apparatus is more particularly designed, and in various other classes, it is frequently desirable to print in different colors, and this result may be attained either by employing separate inking-cylinders of the construction just described and each containing a different kind or color of ink and arranged to supply its ink to different portions of the printing-surface, or a divided ink-reservoir with compartments for inks of different colors may be employed. An ink-reservoir of this latter character is illustrated in Figs. 6, 7, and 8, in which *A* indicates the shell or cylinder, as before, and *B* its shaft, with which the shell is connected by a head or heads *b*, as before. This shell or cylinder is divided by wings or partitions *h* into a suitable number of compartments or chambers *i*, four being represented in the accompanying drawings. Each chamber *i* is provided with a narrow slit or opening *a*, the openings of the respective chambers being at different heights or different distances from the ends of the cylinder or reservoir, as indicated in Fig. 6.

If desired, the shell or chamber *A* may be provided with a cut-off frame *C*, as under the construction previously described, the frame under the second construction being provided with as many cut-off bars *d* as there are chambers or compartments.

For the purpose of supplying ink to the different compartments *I* provide at the top of the shaft *B* a divided hopper *E*, from each

compartment of which a passage *j* communicates with its appropriate ink-chamber *i*.

Having now described the construction of the reservoir, the manner of using the same and the parts used in connection therewith will be explained in connection with Figs. 1 and 2. In said figures *F* indicates the stock-roll or roll of material to be printed, which may be paper, cloth, or other material, as occasion may require. From the roll *F* the material is drawn off and passes between two sets of rolls *G G* and *H H*, the rolls *G G* being made adjustable toward and from the rolls *H H* by tempering-screws *R*, or in any other convenient and well-known manner. The rolls *H H* are the form-rolls, or the rolls carrying the printing-forms, and these forms may be of any description whatever—engraved blocks, stereotyped plates, rubber blocks, or any other common and well-known printing-surface—though for the special uses contemplated by me I have found a rubber type-surface particularly satisfactory.

A A indicate two ink-reservoirs of the description set forth in connection with Figs. 3, 4, and 5.

I indicates a roller, which will be made of printers' composition or other suitable material and which rotates normally in contact with the surface of the reservoir *A*, receiving ink therefrom and spreading it over the outer surface of said reservoir and delivering it from time to time to a larger roller *J*, with which it periodically makes contact.

Cams *K* on the upper and lower ends of each of the shafts *B* of the ink-reservoirs, acting upon the sliding boxes *k* of the roller *I*, serve to move said boxes and the roll away from the reservoir and into contact with the roller *J* and to hold it thus in contact during about a half-revolution of the reservoir, the boxes and the roller *I* being returned to their first position and the roller *I* held in contact with the ink-reservoir by springs *l* bearing upon the sliding boxes *k*, as indicated in Fig. 1. By this arrangement the roll *I* is caused to play back and forth between the reservoir *A* and the roller *J*, and thereby to supply the latter roller with its proper quantity of ink. The roller *J* occupies a fixed position with reference to the reservoir and the inking-rolls *L L*, to which it supplies ink; but said rolls *L L* are mounted in sliding boxes *m*, which are acted upon by springs *n*, and thereby forced away from roll *J* and in contact with the printing-surface of rolls *H H*, except at such times as segmental arms *M*, carried by the rolls *H H*, bear upon and force back the rolls *L L* against the pressure of their springs *n n*. When thus forced and held back by the arms *M*, the rollers *L L*, being in contact with the rotating rolls *J*, receive ink from the latter, and by reason of their joint rotation the ink is evenly distributed over the rolls *L L*. To further insure perfect distribution of the ink, the rolls *J* are arranged to rise and

fall slightly in their bearings, being thus raised and lowered by means of a stud n' , projecting from the shaft and riding upon a cam-ring o , encircling the shaft, as shown in Fig. 2.

N, Figs. 1 and 2, indicates a rigid bar bolted or otherwise made fast to the frame-work of the machine and extending from a point above to a point below the upper and lower ends of the cylinder or reservoir A and parallel therewith. Secured to the bar N at its inner edge is a flexible steel plate O, which is pressed with greater or less force against the surface of the reservoir A at different points in its length by set-screws P, Figs. 1 and 2, this bar or doctor serving to remove any surplus ink from the outer surface of the ink-reservoir. By proper and careful adjustment of this plate or bar the quantity of ink on the surface of the reservoir at different points in its length may be varied, as is sometimes desirable where different kinds of ink are employed, or where it is desired to produce different shades or degrees of color.

The power for driving the apparatus may be conveniently applied to the shafts of cylinders H H, and thence through suitable gearing to the ink-reservoirs and the rollers I and J, the rollers L L being driven either by contact with the rollers H H or with the rollers J J, or both.

It will be understood that the parts described as employed in connection with one of the printing-cylinders H will also be employed with the other of said cylinders, if two cylinders be employed; but it is apparent that a single printing-cylinder may be used, if desired, the two being employed only where two different forms are to be printed at the same time or in the same operation.

The cylinder A may, if desired, be fixed in position and the roller I arranged to rotate against the slotted face thereof—that is to say, the cylinder or ink-fountain A may be secured against rotation and the roller I arranged to rotate in contact therewith just at the edge of the slit or opening through which the ink escapes, thereby taking up the ink and delivering it, as under the previous arrangement, to the roller J.

Having thus described my invention, what I claim is—

1. In a printing apparatus, an ink-reservoir consisting of an upright cylindrical shell or chamber closed at its lower end and provided with a narrow longitudinal slit in its outer wall, through which ink is permitted to pass freely by the action of gravity.

2. In a printing apparatus, an ink-reservoir consisting of a rotatable cylindrical shell provided with a longitudinal slit or opening, and with a cut-off bar movable in relation to said slit or opening to vary its width, substantially as set forth.

3. In combination with the shell or casing of an ink-reservoir, provided with a longitudinal slit or opening, a longitudinal cut-off bar

movable relatively to said slit or opening, the edges of the slit and the bar being oblique or inclined one in relation to the other and the divergence of the two edges increasing from one end to the other.

4. In combination with the upright cylindrical shell A of an ink-reservoir, provided with a longitudinal slit or opening a , a cut-off frame C, mounted therein and provided with a cut-off bar d , and means, substantially as described, for moving said cut-off frame and bar relatively to the slit or opening.

5. In combination with shell or casing A, provided with slit or opening a and with collar f , cut-off frame C, provided with cut-off bar d and lug d' , and adjusting-screw e , passing through the lug d' and bearing at its ends against the ends of the collar f , substantially as set forth.

6. An ink-reservoir for printing apparatus, consisting of a shell or cylinder A, divided into separate longitudinal chambers, and a series of slits or openings in the outer walls of the reservoir, one for each chamber or compartment, the respective slits or openings being located at different points in the length of the cylinder or reservoir, so that each shall deliver ink to different portions thereof.

7. In combination with the cylinder A, having separate chambers I and separate slits or outlets a , the cut-off frame C, provided with cut-off bars d , one for each slit or opening.

8. In combination with the shell or cylinder A, provided with compartments, the partitioned hopper E, applied to the shaft of the cylinder A, and ink passages or conduits j , opening from the respective compartments of the hopper to the respective ink-chambers of the reservoir.

9. In combination with a cylindrical ink-reservoir and with means for rotating the same, a rigid bar N, a flexible scraper-plate or doctor O, and a series of screws bearing upon the flexible plate at short intervals and serving to press its edge into more or less close proximity to the surface of the reservoir at different points, and thereby to vary the extent to which the ink shall be removed therefrom at different points.

10. In combination with an upright cylindrical ink-reservoir A, having a longitudinal slit for the free escape of ink, and with means for rotating the same, an external roller acting in conjunction with and receiving ink from the reservoir A, substantially as set forth.

11. In a printing apparatus, an upright ink-reservoir having a longitudinal slit or opening for the escape of ink, said opening being of diminishing width from its upper toward its lower end.

In witness whereof I hereunto set my hand in the presence of two witnesses.

WILLIAM HALL KERR.

Witnesses:

L. D. COLTRANE,
D. B. COLTRANE.