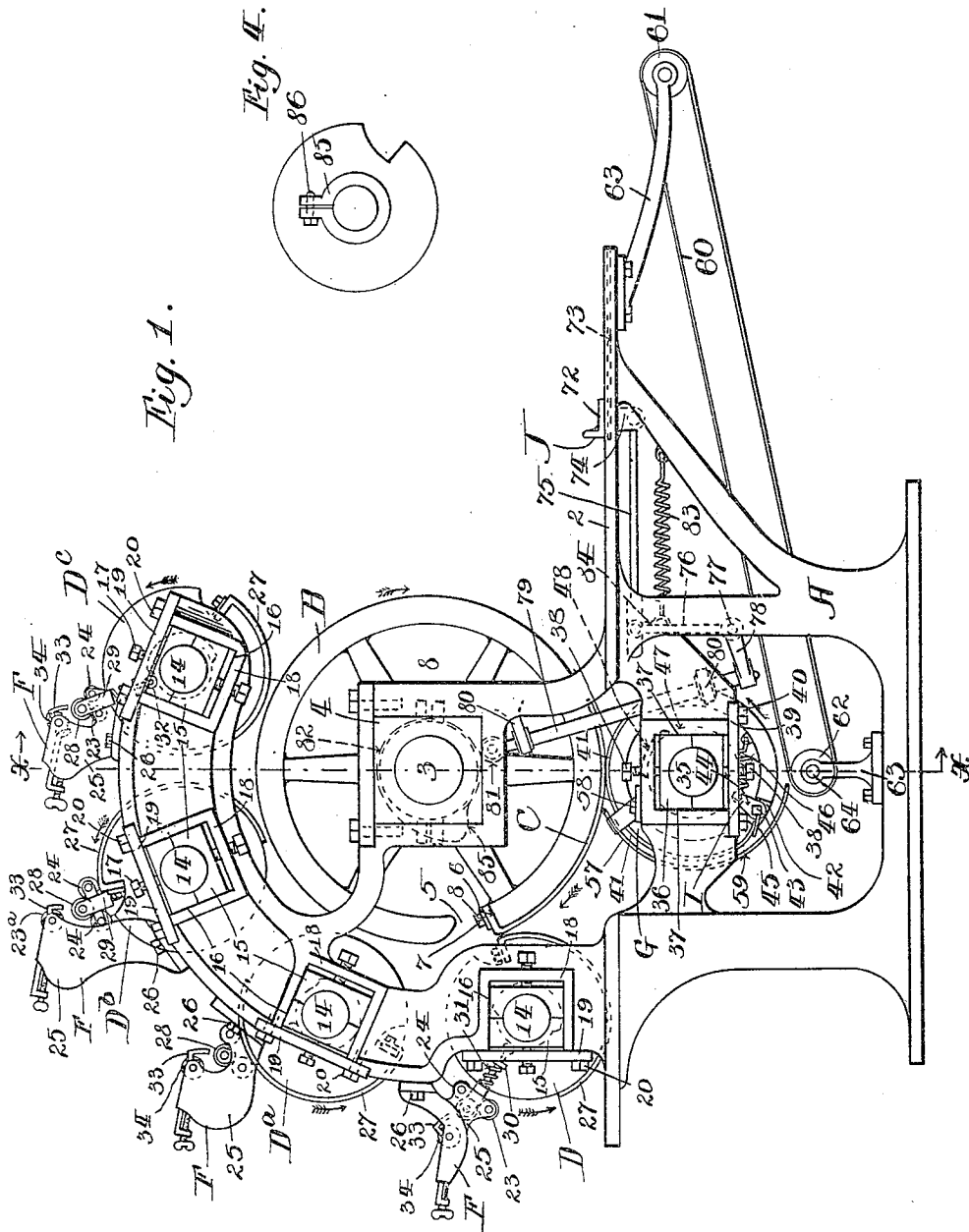


W. C. KAMMERER.
COLOR PRINTING PRESS.
APPLICATION FILED OCT. 31, 1904.

3 SHEETS—SHEET 1.



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Inventor:
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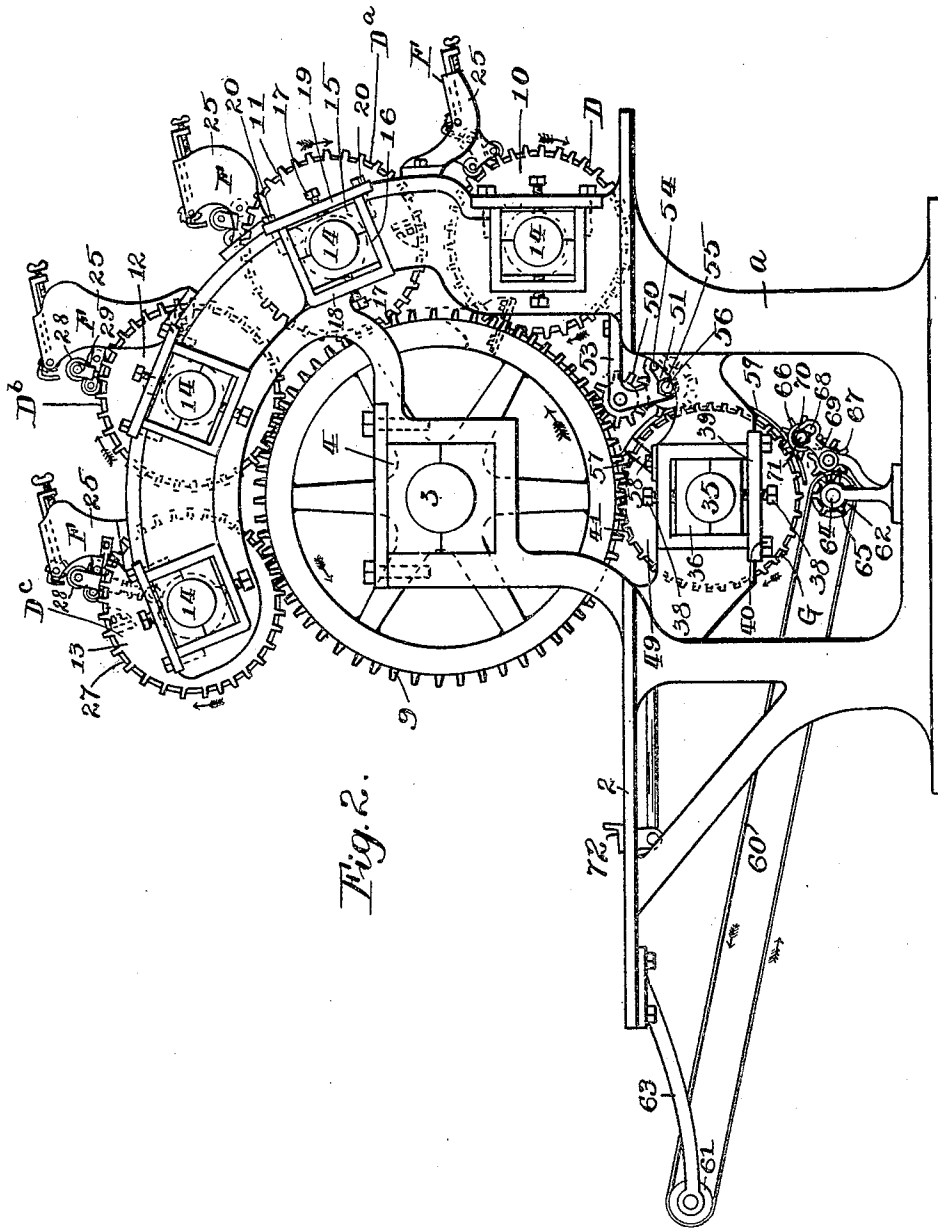


Fig. 2.

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UNITED STATES PATENT OFFICE.

WILLIAM C. KAMMERER, OF ST. PAUL, MINNESOTA.

COLOR-PRINTING PRESS.

No. 801,088.

Specification of Letters Patent.

Patented Oct. 3, 1905.

Application filed October 31, 1904. Serial No. 230,723.

To all whom it may concern:

Be it known that I, WILLIAM C. KAMMERER, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented a new and useful Color-Printing Press, of which the following is a specification.

My invention relates to an improved multi-color-printing press, and has for its object a machine that is adapted to print in different colors during the same operation on sheet metal or other material.

In the accompanying drawings, forming part of this specification, Figure 1 is a side view of my invention. Fig. 2 is a similar view looking at the other side of the machine. Fig. 3 is a sectional view taken on the line *xx* of Fig. 1, and Fig. 4 is an end view of one of the inking-rollers.

In the drawings, let A represent the frame of the machine, which is provided with the bed 2, on which the sheets of metal to be printed are fed. A large cylinder or roll B is mounted on the shaft 3, which has its ends journaled in the boxes 4 of the frame. The cylinder has a longitudinal opening 5 and is formed with a shoulder 6, over which is turned a rubber blanket, or what I have termed a "printing-plate" C, and fastened by means of the bolts 7 and transverse bar 8. Said printing-plate C carries the design to be printed, is inked by the inking-rollers, and conforms to the perimeter of the cylinder in the ordinary manner. Arranged around the perimeter of the cylinder are a series of color-inking rollers D, D^a, D^b, and D^c, as shown, (four in number,) but it is obvious to those skilled in the art to which this invention relates that any number of rollers may be used without departing from the spirit thereof. These rollers are arranged somewhat above the cylinder B, each roller being adapted to ink the surface of the printing-plate C. The cylinder-shaft 3 carries a gear 9, which meshes with the gears 10, 11, 12, and 13. These gears and inking-rollers are mounted on the shafts 14, which are journaled in the boxes 15 and adjustably mounted in the pockets 16 of the frame A by means of the bolts 17, passing through the walls 18 of the pockets and the cover-plates 19 and impinging against said boxes in said pockets. The cover-plates 19 are fastened over the pockets by means of the bolts 20. By adjusting the bolts 17 the boxes may

be moved radially from the center of the shaft 3 and the gears 10, 11, 12, and 13 adjusted to mesh properly. The color-plate 27, (made of type-metal,) which is carried by each of the color-rollers, may be adjusted to bear against the impression-plate C on the cylinder to transmit ink on said impression-plate, as desired. Each of the shafts 14 carries cams 21 and 22 near its ends for the purpose of operating the inking feed-rollers, which are positioned adjacent to the perimeter of the inking-rollers.

A fountain F (containing ink) above each inking-roll is of ordinary construction and provided with rollers which are arranged and constructed as follows: A pair of rollers 23 and 24 are loosely journaled upon the frame 25, which is fastened upon the main frame A of the machine by bolts 26, and bear upon the raised surface of the inking-plate 27 on the perimeter of the inking-roller. A feed-roller 28 is loosely journaled upon the arms 29. These arms slide through brackets 30 on the frame and press the feed-roller 28 against the perimeters of the rollers 23 and 24 by means of the contraction-springs 31. The lower ends of the arms 29 carry antifric-tion-wheels 32, which bear against the working surfaces of the cams 21 and 22. As the inking-rollers revolve the working surfaces of the cams raise the feed-rollers 28 and cause them to impinge against the roller 23^a in the fountain and receive ink therefrom each time the inking-roller makes a revolution. Each cam permits its corresponding feed-roller to work in contact with the rollers 23 and 24 while the color-plate 27 is bearing against the latter. Each time the feed-roller 28 is raised into contact with the fountain-roller 23^a the arms 29 move a dog 33, which is carried by the frame 25 to engage a toothed wheel 34 on the fountain-roller and cause the latter to turn a step, thus receiving fresh ink from the fountain as it revolves therein.

Revolving with its perimeter in working contact with the perimeter of the cylinder is a gripping or feeding roll G, which is mounted on the shaft 35. This shaft has its ends journaled in the boxes 36, which are adjustably held in the sockets 37, between the impinging ends of the bolts 38, passing through the frame and cover 39. This cover is fastened by the bolts 40, which are threaded in the frame. The surface 41 is made of metal or other suit-

able material. The roller G has a longitudinal opening 42, in which is mounted gripping mechanism I, which is adapted to receive and hold the plates or materials which are to be printed upon. This gripping mechanism consists of a shaft 43, which is journaled on the roller and carries a lever 44 and gripping plate or jaw 45. The free end of the lever 44 is connected by a spring 46 with the gripping-roller, the tendency of said spring being to draw the gripping-jaw 45 down toward the surface of the gripping-roller and engage the edge of the piece of material to be printed upon and hold the same while the machine is printing. A stationary cam 47, having a raised surface 48, is fastened to the frame of the machine. This raised surface 48 trips the lever 44 and opens the gripping-jaw 45 when the piece of material to be printed upon is passed over the impression-plate C and holds the gripping-jaw open until a new piece of material to be printed upon has entered between the gripping-jaw and the surface of the gripping-roller. The gripping-roller makes two revolutions while the cylinder makes one and is connected with said cylinder by means of the gear 49 on the shaft 35 and transmitting-gears 50 and 51, which mesh with the gears 49 and 9. These transmitting-gears are journaled on the bracket 53, the gear 51 being adjusted in the slot 54 by means of the nut 55 on the shaft 56. The object of making the gear 51 adjustable is to permit the gear 49 and the gripping-roller G to be raised and lowered by the bolts 38. The purpose of the gears 50 and 51 is to provide a positive driving connection between the cylinder and gripping-roller when their gears 9 and 49 do not mesh closely. A guard 57 is fastened upon the frame by means of the bolts 58 and has arms 59 curved around the perimeter of the gripping-roller to hold the free ends of the pieces of material to be printed upon. A conveyer 60 in the form of a belt is positioned at the lower ends of the arms 59 of the guards and receives the pieces of printed material as they are released by the gripping-jaw 45. The conveyer-belt 60 passes around the pulleys 61 and 62, which are journaled upon the brackets 63, (in turn carried by the frame of the machine.) The shaft 64 of the pulley 62 carries a gear 65, which is connected by the gears 66 and 67 with the gear 49 on the gripping-roller. The gear 66 is adjusted in the slot 68 of the arm 69 by the nut 70 on the shaft 71. The object of the gears 66 and 67 and the adjustment formed by the shaft 71 and nut 70 is to make proper working connection with the gear 49 when it is raised or lowered.

The plates or material to be printed are fed into the machine by the feed mechanism J, which consists of a transverse carriage 72,

which is adapted to oscillate forward and backward through the slots 73 in the bed 2. The lug 74 depends from the carriage 72, to which is pivotally attached a pitman-rod 75, one end of which is pivotally connected with a bell-crank lever 76, which is pivoted at 77 upon the frame. An arm 78 of the bell-crank lever is loosely connected with an operating-rod 79, which slides in the guides 80 on the frame. The upper end of the rod 79 carries an anti-friction-roller 81, which bears upon the surface of the cam 82, carried on the shaft 3. As the machine operates the cam depresses the rod 79 and causes the rod 72 to slide forward during each revolution of the cylinder. A spring 83, connected with the frame and the arm 84 of the bell-crank lever 76; returns the carriage and its operating parts to normal position after the rod 79 trips over the shoulder 85 on said cam.

In operation the sheets of metal to be printed upon are placed by hand on the bed in front of the carriage 72. The drive-shaft 3 is revolved by a drive-pulley (not shown) or other suitable means in the direction of the arrows indicated in Fig. 1. The inking-rollers and the feed-roller are caused to revolve in the direction of the arrows also indicated. Each plate to be printed upon is fed by the carriage 72 between the surface of the impression-plate C and the perimeter of the feed-roller. As the cam 82 turns the shoulder 85 depresses the rod 79 and causes the carriage 72 to move forward. As it moves forward the raised surface 48 on the cam 47 opens the gripping-jaw 45 to receive the plate of material to be printed upon. As the parts continue to operate the jaw 45 closes and grips the printing material and carries it around until the end of the lever 44 impinges against the shoulder or raised surface 48 of the cam 47. The jaw 45 then again opens and releases the printing material, which falls upon the conveyer 60 and is carried away from the machine. The gripper remains open until the end of the arm 44 returns it to closed position by the spring 46, when it passes over the shoulder 48. The sheets of material are placed in front of the carriage 72 every other revolution of the feed-roller—that is, every time the impression-plate is about to pass over its surface. As the cylinder B revolves the color-rollers turn the color-plates to register with and ink the surface of the impression-plate. Each of the color-plates is so constructed as to cause the part of the picture or printing matter on the surface of the impression-plate to receive the desired coating of ink. Each fountain F contains one color of ink different from the colors of all the other fountains, so that each color-plate applies a single color of ink on the surface of the impression-plate different from all the colors applied by the other color-plates. The color-

plates apply a complete impression on the blanket, which transfers it to the plates to be printed upon. The color-rollers make two revolutions to every one of the cylinder, and the color-plates are so adjusted and proportioned on the surface of the color-rollers as to register with the surface of the impression-plate. The cylinder, color-rollers, and feed-roller may be fastened upon their respective shafts by means of a split sleeve 85 and bolt 86, as shown in Fig. 4. This construction is for the purpose of adjusting and causing the surfaces of the color-plates to register with the surface of the impression-plate when the parts of the machine are set and operated.

It is obvious that by means of the construction described one, two, three, or four colors may be printed at a single operation, as described.

Having described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. A machine of the class set forth, comprising a printing-cylinder, a series of inking-rollers arranged to revolve about the perimeter of said cylinder, means for feeding ink to said rollers, a feed-roller revolving in contact with said cylinder to carry the material to be printed upon between the perimeters of said cylinder and feed-roller, means for fastening the printing-plate on said cylinder, color-plates on the perimeters of said rollers, a gripper on said feed-roller, means for feeding the sheets of material to be printed upon successively to said gripper, means for opening said gripper to engage said sheets and release them, and means for driving said parts.

2. A machine of the class set forth, comprising a printing-cylinder carrying a printing-plate, a feed-roller, a gripper coacting with said feed-roller, a plurality of color-plates, means for turning said color-plates to apply ink of different colors to the surface of said printing-plate, means for supplying ink to said color-plates, means for opening and closing said gripper to successively engage the sheets of material to be printed upon and release them, means for feeding said sheets of material to said gripper, and means for driving said parts.

3. A machine of the class set forth, comprising a cylinder carrying a printing-plate on its perimeter, a roller revolving below said cylinder, a gripper carried by said roller, means for feeding sheets of material to be printed upon successively to said gripper, means for operating said gripper to successively engage such sheets of material, move them past said cylinder and release them successively, a series of inking-rollers revolving in the same surface direction with said cylinder and carrying inking-plates upon their perimeters, means for feeding ink of different colors to said ink-

ing-plates, a conveyer adapted to receive the sheets of material as they are released by said gripper, and actuating mechanism.

4. A machine of the class set forth, comprising a cylinder, a printing-plate carried upon the perimeter of said cylinder, a roller below said cylinder, a gripper carried by said roller, means for operating said gripper to carry sheets of material to be printed upon between the printing-plate on said cylinder and the perimeter of said roller and release said material after it has been printed upon, a series of inking-rollers, color-plates carried on the perimeters of said rollers and adapted to register with and ink the surface of said printing-plate, means for feeding ink of different colors to said color-plates, a table for the printing material, feed mechanism coacting with said table and gripper to feed the material to be printed upon successively to said gripper, and actuating mechanism.

5. A machine of the class set forth, comprising a cylinder, means for fastening a printing-plate on said cylinder, a feed-roll below said cylinder, a gripper carried by said feed-roll, means for operating said gripper to engage and feed the material to be printed past said cylinder, feed mechanism by which the material to be printed upon is fed to said gripper, means for operating said gripper to release said printing material, a conveyer for said printing material after it is released by said gripper, means for applying successively ink of different colors to the printing-plate on said cylinder, and means for operating said parts.

6. A machine of the class set forth, comprising a printing-cylinder, a printing-plate, means for fastening said printing-plate on the surface of said cylinder, a feed-roller adapted to revolve in contact with the surface of the printing-plate carried by said cylinder, a gripper carried by said feed-roller, feed mechanism for the material to be printed upon, means for actuating said gripper to engage said material to be printed upon and carry it past the surface of said printing-plate, means for releasing said printing material from said gripper, a series of inking-rollers adapted to successively apply ink of different colors on the surface of said printing-plate, means for feeding ink to each of said inking-rollers, inking-plates carried by said inking-rollers adapted to register with the surface of said printing-plate, and means for actuating said parts.

7. A machine of the class set forth, comprising a cylinder B, a feed-roller G, gripping mechanism I on said feed-roller, feed mechanism J adapted to feed the material to be printed upon to said gripper, means for actuating said gripper to release the material to be printed upon from said feed-roller, a series of inking-rollers, a printing-plate C carried

by said cylinder, inking-plates 27 carried by
said inking-rollers and adapted to register
with said printing-plate, fountains F by which
ink is fed to said color-plates, a conveyer to
5 deliver the printing material as it is released
by said gripping mechanism, and drive mech-
anism for actuating said parts.

In testimony whereof I have signed my name
to this specification in the presence of two sub-
scribing witnesses.

WILLIAM C. KAMMERER.

Witnesses:

E. M. BOESEL,

F. G. BRADBURY.