A. P. HARLAND.

PRINTING PRESS.

APPLICATION FILED FEB. 15, 1909.

956,084.

Patented Apr. 26, 1910.

3 SHEETS—SHEET 1.

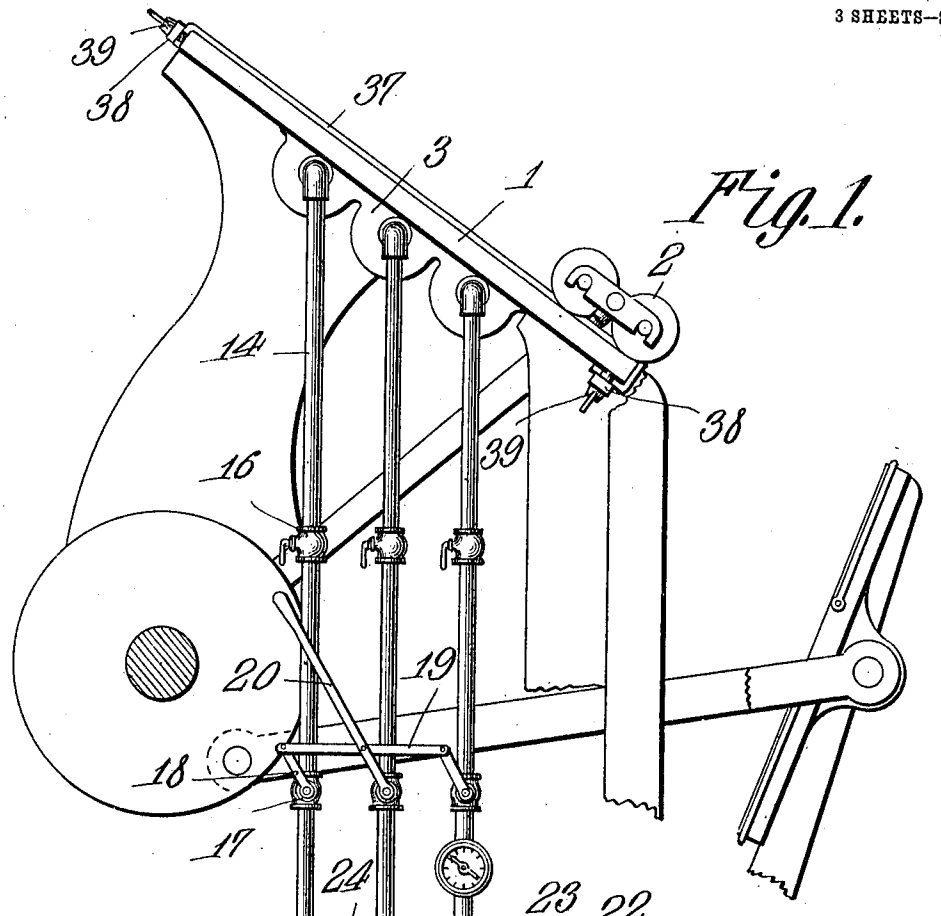


Fig. 1.

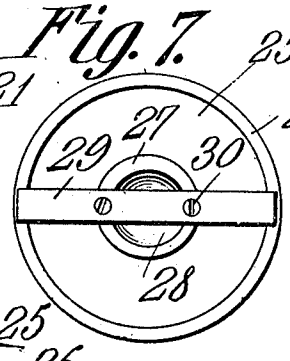


Fig. 7.

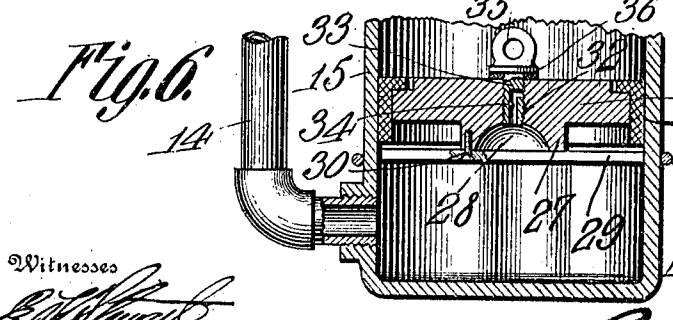


Fig. 6.

Witnesses

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3 SHEETS—SHEET 2.

Fig. 2.

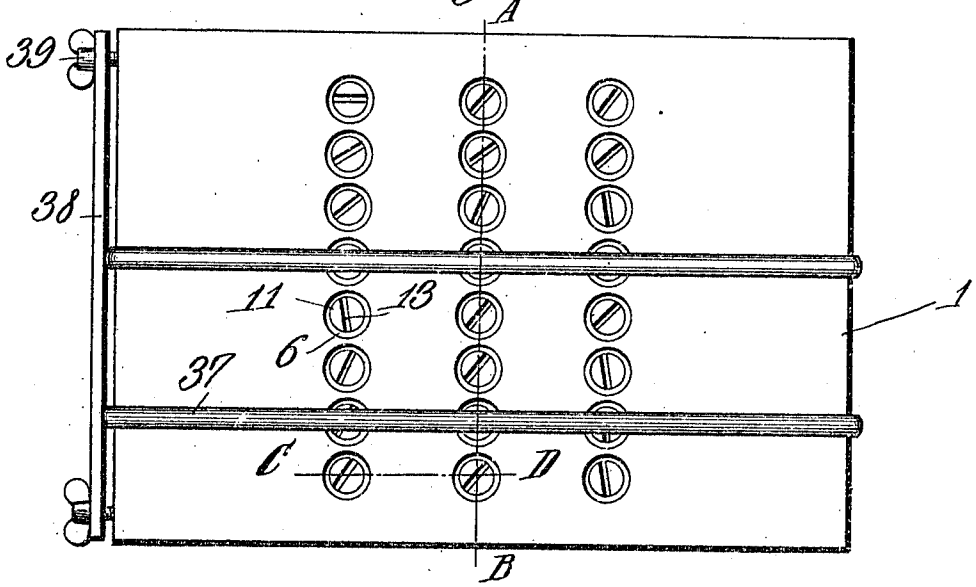


Fig. 3.

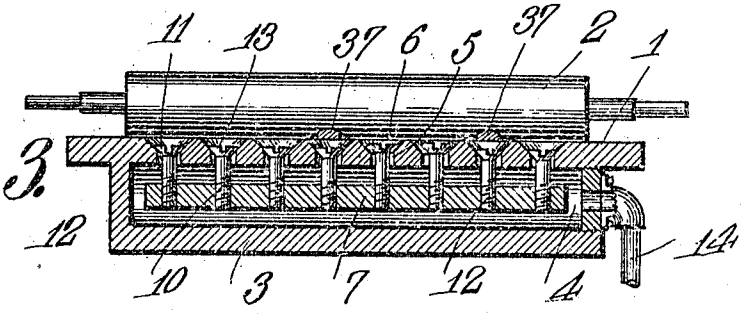


Fig. 4.

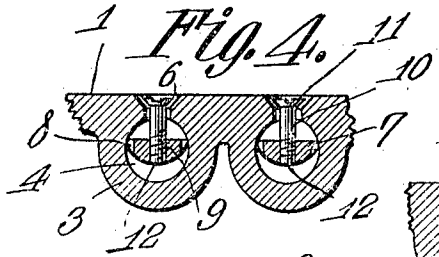


Fig. 12.

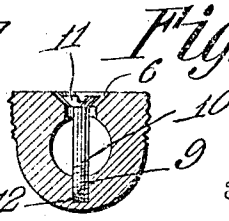
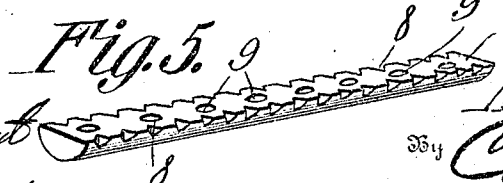


Fig. 5.



Witnesses

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956,084.

Patented Apr. 26, 1910.

3 SHEETS—SHEET 3.

Fig. 10.

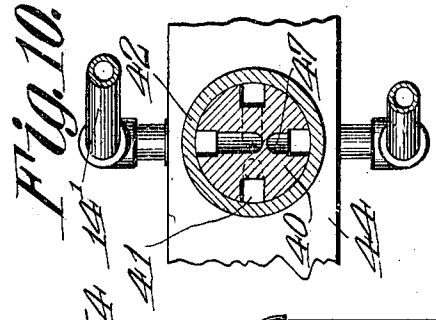


Fig. 11.

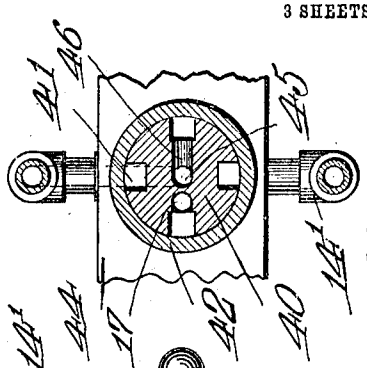


Fig. 8.

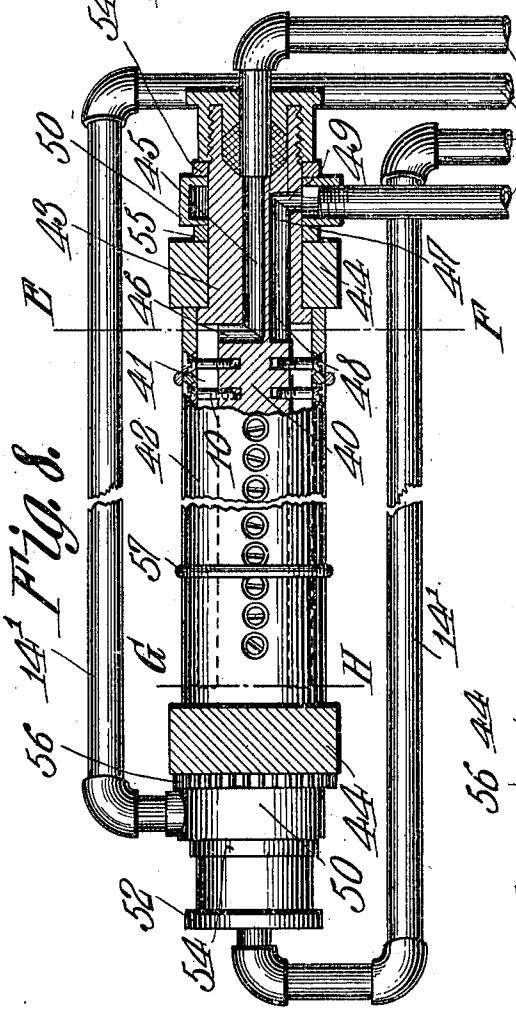
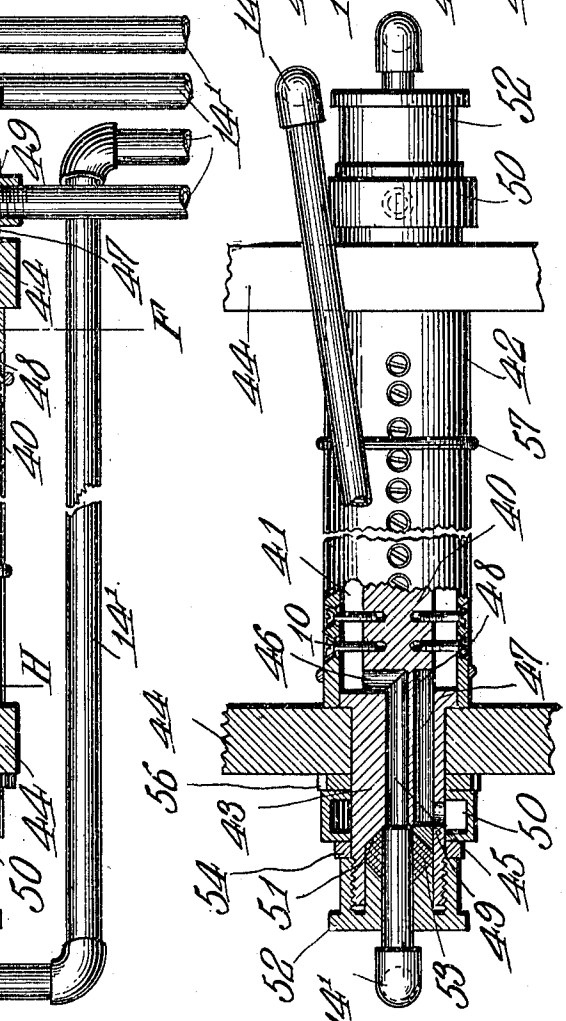


Fig. 9.



Witnesses

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UNITED STATES PATENT OFFICE.

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PRINTING-PRESS.

956,084. Specification of Letters Patent. Patented Apr. 26, 1910.

Application filed February 15, 1909. Serial No. 477,916.

To all whom it may concern:

Be it known that I, ALLEN P. HARLAND, a citizen of the United States, residing at Tupelo, in the county of Lee and State of Mississippi, have invented a new and useful Printing-Press, of which the following is a specification.

This invention has reference to improvements in printing presses and is designed to provide a means whereby black ink or colored inks, the latter either singly or in combination may be fed to the inking rollers.

The present invention is adapted to printing presses using the table distribution of the ink where the rollers take the ink from a flat ink covered surface or it may with equal facility be applied to presses using curved type forms, in which case the ink feeding element is made cylindrical.

By the present invention ink of a single color or tint is supplied through a duct in the inking table or cylinder and from this duct the ink reaches the surface of the table or cylinder, through passages in which are located adjustable valves so arranged that the amount of ink delivered from the duct shall be entirely under the control of the operator. By this means single colors may be supplied, and it is to be understood that by the term "colors" it is intended to also include black and white inks, or two or more colors may be supplied and combined to form shades or tints.

Moreover, the invention comprises means whereby a color or combination of colors may be confined to a circumscribed zone under the will of the operator so that a single inking roller may carry two or more colors without danger of the colors blending.

The invention will be best understood from a consideration of the following detail description taken in connection with the accompanying drawings forming a part of this specification, in which drawings, Figure 1 is a side elevation, with some parts broken away and others diagrammatically displayed, of a printing press of the table distribution type and commonly known as a job press. Fig. 2 is a plan view of an ink distributing table for use in a press of the type shown in Fig. 1. Fig. 3 is a section on the line A—B of Fig. 2. Fig. 4 is a section on the line C—D of Fig. 2. Fig. 5 is a perspective view of a valve supporting bar designed for use in connection with the structures of Figs. 1 to 4. Fig. 6 is an enlarged section through one of the main ink supplying reservoirs. Fig. 7 is a bottom plan view of a piston or follower used in the ink reservoirs or tanks. Fig. 8 is an elevation with parts in vertical central section of an ink distributing roller adapted for cylinder presses. Fig. 9 is a plan view of the structure shown in Fig. 8 with parts in horizontal central section. Fig. 10 is a section on the line E—F of Fig. 8. Fig. 11 is a section on the line G—H of Fig. 8. Fig. 12 is a detail section of a modified arrangement of ink conduit and valve structure.

Considering first the structure shown in Figs. 1 to 7 there is shown an ink table 1 which is designed to be traversed by ink rollers 2 in the usual manner except that it is customary to distribute the ink upon the table 1 by means of a distributing roller usually operated by hand, the ink occupying the entire active face of the table 1 so that it is only possible to print in one color, which term as before stated is intended in this description to include both black and white, and if it be desired to change the color then it is necessary to clean the surface of the table thoroughly before another color can be used.

When the table 1 is constructed in accordance with the present invention it may be cast with laterally extending bosses or enlargements 3, or these parts may be otherwise shaped and these portions of the table are cored or bored out to form ducts which may if desired extend nearly the width of the table. If these ducts 4 be bored out then they will be circular in cross section and if cored out they may be otherwise shaped. It is of course within the scope of the invention to form these ducts by channeling the table and using cover pieces, or in fact any other means may be employed for forming the channels or ducts.

Formed through the top of the table and entering the ducts 4 are passages 5 with their upper ends preferably countersunk as shown at 6. The passages 5 are arranged in transverse rows conforming to the ducts 4 and the number of these passages may be many or few as best suited to the type of press and the size of the table.

In each duct 4 there is located a bar 7 shown separately in Fig. 5. This bar is preferably flat on the upper surface and

rounded on the opposite surface and along the edges provided with serrations or passages 8 and through the bar are tapped a number of holes 9 matching the passages 5 in any one duct 4.

Extending through each passage 5 is the stem of a valve 10 each valve having a head 11 adapted to be seated in the countersunk portion 6 and fit the same snugly with the upper end of the head 11 below the surface of the table 1. The other end of the valve stem, that is the end remote from the head 11 is threaded as shown at 12 and enters a corresponding hole 9 in the bar 7. The head 11 is provided with a transverse slot 13 for the reception of a screwdriver, the valve 10 with its head 11 and threaded end 12 simulating the shape of an ordinary machine screw. The diameter of the bar 7 is such that when the valves are screwed into the same so that the valve heads 11 are seated in the countersunk portions 6 the serrated edges of the bar 7 engage the sides of the ducts 4 thus holding the bar 7 above the bottom of the ducts and at the same time causing the seating of the heads 11 in the countersinks 6. It will be evident that on unscrewing any one of the valves 10 the corresponding passage 5 is opened to an extent agreeable to the extent of movement of the valve due to its threaded end 12. By this means the operator may open the valves from a very minute extent to the full extent permitted, which latter condition is when the outer face of the head of the valve is flush with the top of the table 1. In practice such an extent of opening the valve is seldom if ever needed, but in practice it may be found expedient to make the depth of the countersink 6 such that when the valve is opened so the head of the valve is flush with the top of the table 1 then the opening is to the proper extent.

In the drawings there are shown three ducts 4 and three rows of valves 10, but it is evident that a greater number of ducts and valves may be used or under some circumstances, a lesser number may be used.

The ink in the ducts 4 should be under super-atmospheric pressure so that when a valve 10 is opened the ink will rise through the passage 5 and out through the countersink 6 and spread on the surface of the table. For this purpose and in order to supply ink as needed to the ducts 4 each duct is connected by a pipe 14 to an ink reservoir 15 shown in the drawings in the form of a closed tank. In each pipe there is provided a valve 16 which may be individually actuated by the operator to open or close or throttle the pipe 14 and each pipe is also provided with a valve 17 having its valve stem connected to a lever 18 and the several levers 18 are connected by a common link 19 so that the valves move simultaneously. One of the levers 18 may be extended as shown at 20 to constitute a manipulating handle. One of the tanks 15 is connected to a pump 21 through a pipe 22 which in turn may include a controlling valve 23 and the several tanks or reservoirs 15 are connected in series by pipes 24 near their upper ends while the pipes 14 enter the reservoirs at the lower ends of the latter. The pump 21 is shown as an ordinary air pump for creating an air pressure in the tanks 15, but it will be understood that this pump is typical of any means of creating a pressure in said tank and while such a pump is particularly adapted for single presses, the invention is not to be considered as limited to such means.

Assuming that each reservoir 15 contains a supply of ink and that a pressure be created above the ink by means of the air pump 21 or by any other means, then if the valves 16 and 17 be opened ink will flow through the pipes 14 into the ducts 4 and ultimately find its way to the surface of the table through such valves 10 as may be open. Since some colors of ink will be used more extensively than other colors the reservoirs 15 may vary in correspondence to the demand for the ink. Also if more ink be used from one duct 4 at any one time than is being used from another duct 4 then the flow of ink may be equalized by a suitable manipulation of the valves 16. The valves 17 are designed to control the several pipes 14 alike and provide a convenient means for shutting off the supply or turning it full on while the adjustment of the flow to the several ducts 4 may be controlled by the valves 16.

Because of the viscidity of printer's ink, pressure applied thereto directly through a mobile fluid such for instance as air, will tend to produce a more rapid outflow of the ink at the outlet of the tank than will be responded to by the entire surface of the ink in the reservoir with the result that the air under pressure will form the surface of the ink into an invert cone, the apex of which is at the exit of the reservoir, and even while a large quantity of ink may still be in the reservoir it will no longer feed through the pipes 14. To overcome this trouble each reservoir cylinder 15 is provided with a piston or follower 25 provided with suitable peripheral packing 26 which may be in the form of an ordinary cup leather or packing tending to render the packing effect more efficient by the back pressure encountered. At the center of the piston is a projecting boss or hub 27 preferably hollowed out as shown at 28 and this boss carries a magnet 29 preferably in the form of a permanent bar magnet extending diametrically across the piston or follower into close relation to the inner wall of the reservoir 15, which latter is made of non-magnetic material. The

magnet 29 may be secured to the piston or follower 25 which also should be of non-magnetic material by suitable screws 30. Exterior to the cylinder 15 there is applied an iron ring 31 easily but not too snugly fitting the cylinder. Extending through the center of the piston or follower 25 is a screw-threaded passage 32. Normally seated in the threaded passage 32 is a screw plug 33 having extending from one end an axial passage 34 finally terminating in a radial passage opening at the side of the plug. The upper end of the plug is formed into a handle 35 by means of which the plug may be rotated to screw it into and out of the passage 32 and also by means of which the piston or follower 25 may be lifted. The handle 35 is expanded to form an abutment for a packing washer 36 which when the plug is screwed home engages the upper surface of the follower 25 and so effectually seals the passage 32 at this point.

Let it be assumed that a sufficient quantity of ink is placed in a reservoir 15 then the screw-plug 33 is unscrewed until the radial extension of the passage 34 is above the upper face of the follower 25 when the latter is introduced into the cylinder 15 and the air trapped between the upper surface of the ink and the follower finds ready escape through the passage 34. By this means the follower may be brought down into actual contact with the surface of the ink without imprisoned air. Now the screw-plug 33 is turned until the washer 36 is brought into firm contact with the upper surface of the follower and the radial portion of the passage 34 is below such upper surface so that no air can either enter or escape through the follower 25, the packing 26 preventing any such passage of air at the periphery of the follower. Now when air pressure is established above the follower 25 the latter is forced downward under such pressure and the ink will flow evenly through the pipe 14 until the supply within the reservoir is actually exhausted. When the reservoir is filled with ink and the follower introduced then the ring 31 is lifted until it is within the influence of the magnet 29 where it will be held by magnetic contraction which may be supplemented by the cramping of the ring, on the outside of the cylinder 15. This cramping of the ring 31 is not sufficient to hold it without the magnetic attraction of the magnet 29 and as soon as the follower moves downward because of the outflow of the ink the portion of the ring attracted by the magnet will drop until the ring again cramps, and so the ring will follow down the cylinder as the follower lowers. When the ink is exhausted and it is desired to remove the follower for the introduction of more ink then the screw plug 33 is unscrewed until communication between the air above the follower is established with the surface of the ink and then the follower may be readily lifted. By this means the ink is maintained at all times free from contact with air and so is prevented from evaporating and so thickening and is also prevented from contamination by dust or otherwise.

It is of course evident that in place of air pressure water pressure may be used or a spring pressure may be exerted upon the follower 25 or the follower may be made so heavy as to force the ink under the desired pressure by gravity acting on the follower itself.

It is sometimes desirable to print certain portions of the matter to be printed in one color and certain other portions in another color. In order to do this with a job press having but a single pair of inking rollers there are provided division strips 37 designed to lie on the table 1 in the path of the rollers. These strips may be in the form of wires since they need have but a moderate thickness and when rolled upon by the rollers they cause a progressive indentation of the surface of the roller where engaged by the strips since the composition of the rollers is somewhat elastic, and the surface of the rollers where indented by the wire or strip 37 immediately returns to its normal position when disengaged from said wire or strip 37. These wires are disposed parallel one with the other and longitudinal of the table 1 and circumscribe the zone of color taken up by the rollers 2.

Let it be supposed that it is desirable to print with two colors side by side then a wire 37 will be adjusted on the table 1 to a position corresponding to the space separating the type or imprinting surfaces to be supplied with the different colored inks. Of course any means may be provided for holding these wires in place and a simple means is shown in Fig. 2 where a clamp strip or bar 38 is provided and clamps the ends of the strips between the bar and the corresponding end of the table 1 while thumb screws 39 serve to fasten the bar in place while at the same time permitting the ready loosening of the bar for the changing of the wires or strips 37 when desired. Let it be assumed by way of example that there are three ducts 4 and one is supplied with black ink, another is supplied with red ink, and the third is supplied with blue ink. Let it further be supposed that it is desirable to print a certain portion of the surface to be imprinted in black and a certain in red. A strip 37 is adjusted so as to divide the black and red zones one from the other. Now a sufficient number of the valves 10 controlling the outflow of ink from the duct containing black ink are opened on one side of the strip 37 while a sufficient number of valves 10 of

the duct containing the red ink are opened on the other side of the strip 37. Ink is forced out upon the table 1 by the pressure acting on the ink reservoirs 15 and becomes distributed upon the table but the black ink is prevented from reaching the red zone while the red ink is prevented from reaching the black zone by the division strip or wire 37. When the rollers 2 pass over the table already supplied with red and black ink then the strip 37 will indent the surface of the roller where engaging the table and because of the elasticity of the material of the composition making up the roller the indentation will be slightly rounded between the wire 37 and where the roller engages the surface of the table 1, the wire itself being rounded on the upper surface where it engages the roller. Because of the viscidity and non-flowing qualities of the ink employed the rollers will take up ink only where they actually engage the ink on the table and will be entirely free from ink where engaged by the strip 37. Consequently they will apply ink to the type only where the ink is on the rollers and consequently there will be a sharp line of demarcation between the two inking zones of the roller under the conditions assumed and all blending of the different colored inks is thereby prevented. If more than two colors are desired then more strips 37 are used and only those valves 10 are opened which will permit the issuance of ink of the color desired to any one zone on the table 1.

Unless it be desired to produce colors by the combination of two or more other colors, then valves of but one conduit 4 are opened on the same side of a strip or wire 37.

Considering the showing of Fig. 2 let it be assumed that the inking rollers move from right to left and return again to the right in traversing the table 1, and that it be desired to use ink from the three conduits indicated in three zones defined by the two wires or strips 37. Let it also be assumed that the left hand line of valves shown in Fig. 2 and extending at right angles to the length of the strips 37 communicate with a single duct in which there is black ink. Let it be supposed that the intermediate line of valves communicates with the duct containing red ink and that the right hand line of valves communicates with the duct containing blue ink. Let it also be supposed that there are two strips or wires or strands 37 parallel with each other and with the long sides of the table and spaced apart agreeable to the desired width of the zones of color to be applied. Under the conditions assumed let it be supposed that the wider zone is to be imprinted in black ink, the narrow zone in red ink and the intermediate zone in blue ink, then the valves in the left hand row between the upper one of the two wires or strands 37 and the long side of the table, as viewed in Fig. 2, will be opened while all the other valves of this particular row and all communicating with the same duct will be closed. The valves opening into the right-hand duct and between the two wires or strands will be opened to supply blue ink to this particular portion of the table while all the other valves of the corresponding duct will be closed. The valves in the intermediate row and opening into the intermediate duct and between the lower strand or wire 37 and the corresponding long side of the table will be opened to supply red ink. Since the pressure within the several reservoirs 15 is the same because of the interconnection of these reservoirs with the source of pressure, the valves 16 must be separately adjusted to cause the delivery of the proper amount of ink to the several valves 10. Now when the inking rollers 2 are caused to move over the table they will pick up black ink from the black zone and red ink from the red zone and blue ink from the blue zone and the bands of ink upon the rollers will be sharply defined by narrow portions about the rollers clean of ink because the rollers are prevented from taking up ink where engaged by the wires or strands 37. The result is that the type are inked in accordance with the bands of color upon the inking rollers. Of course any other arrangement of colors on the table may be provided by opening the proper valves to feed the colors in the desired zones. Any color may be presented in any zone by a proper manipulation of the valves 10 and the number of zones and the width of the zones is determined by the number of wires or strands 37 and their relative distances apart.

It is to be observed that the serrations 8 along the edge of each bar 7 may be sufficient in number and also deep enough to permit the free movement of the inks in the conduits 4 past the bar and out through the valves 10 which may be opened.

In Figs. 8 and 9 is shown the ink feeding element adapted for printers using curved type forms and the said ink feeding element is therefore cylindrical, but the principle of the invention is the same as in the structure shown in the figures previously described. In the structure of Figs. 8 and 9 there is provided a cylinder 40 in which is formed radial channels 41 preferably equally disposed and in the particular example shown in the drawings these channels are four in number but it will be understood that a greater or lesser number may be used as desired. These channels are the counterparts of the ducts 4 and are provided for the same purpose. In order to convert the channels 41 into ducts the cylinder 40 is surrounded by a sleeve 42 which may be shrunk thereon in order to form a tight con-

nection. Of course the sleeve 42 may be otherwise secured about the cylinder 40. In the particular structure shown the ends of the cylinder 40 beyond the inclosing sleeve 42 are reduced in diameter and constitute journals for the support of the cylinder and sleeve which together, because of the function of the device, may be termed an inking roller. The journals, indicated at 43, have journal bearings in suitable supports 44 which may form part of the press structure. At each end the projecting portions 43 of the cylinder 40 are bored axially as indicated at 45 and this axial or central bore is met by a radial passage 46 bored into the cylinder 40 from one of the channels 44 so that the bore 45 is connected to a channel or duct 41. Each end 43 of the cylinder 40 is also bored eccentrically as indicated at 47 to form a longitudinal passage alongside of the passage 45 but out of communication therewith. Radial passages 48 and 49 connect the passage 47 with one of the channels or ducts 41 at one end and with the exterior of the journal extension 43 at the other end beyond the bearing 44. Surrounding the extension 43 outside of the journal 44 and coincident with the passage 49 is a hollow collar 50 which may be held against rotation and still be at all times in communication with the passage 47 through the passage 49. The outer end of each portion 43 of the cylinder 40 is countersunk as indicated at 51 to receive a packing gland 52 and suitable packing 53. A pipe 14′ enters through the gland 51 and communicates with the passage 45 and this pipe 14′ is assumed to be connected with a reservoir 15 of ink in which reservoir there is established a super-atmospheric pressure. The gland 52 is so constructed as to confine the collar 50 between two packing rings 54 and 55 and at one end of the structure one of the packing rings 55 may be formed with exterior gear teeth 56 for the application of driving power to the inking roller, in which case the ring 55 is made fast to the journal extension 43. Other pipes 14′ are tapped into the hollow collars 50 and are assumed to conduct ink from suitable reservoirs 15 to these collars from which the ink flows through the passages 47 to the respective channels 41. It is to be observed that the channels 41 extend longitudinally of the inking roller and the sleeve 42 is bored at suitable intervals to form valve seats 6 for valves 10 entering the ducts or channels 41 and having their threaded stem tapped into suitable threaded sockets in the cylinder 40. In this structure the valves are operated in the same manner as in the structure shown in Figs. 1 and 2. The ink conveying channels extend in the direction of the length of the roller while the latter revolves about a longitudinal axis. The ink supplying roller is assumed to take the place of the usual vibrating roller which feeds ink to the composition rollers which latter are brought into contact with the type to be inked. In order to divide the ink supplying roller into zones the same as the wires or strands 37 divide the table 1 into a flat zone, there are provided elastic rings 57, rendered elastic by splitting so as to hug the sleeve 42 frictionally under the elastic grip caused by the tendency of the rings to contract. The rings may be expanded sufficiently to permit their location at any point along the length of the ink supplying roller, and these rings 57 act in the same manner as do the wires or strands 37 on the table 1. The operation of the structure shown in Figs. 8 and 9 is identical with that of the structure shown in Figs. 1 and 2 except that in Figs. 1 and 2 the ink supplying devices are included in a table while in Figs. 8 and 9 they are included in a cylinder.

The invention is by no means limited to any particular number of ink ducts in the inking device nor to any particular number of valves to each duct. The valves may be placed quite close together and are actually quite small, the showing of the drawings so far as the valves and the passages closed thereby are concerned being quite near the zone employed in actual practice. From this it will be seen that in a full size press a row of valves may include many individual valves. The wires or strands 37 are also shown in the drawings as much larger than are used in practice, the thickness and width of the wire being only sufficient to keep the particular portion of the roller engaged thereby out of contact with the inking surface.

With the present invention a great variety of colors may be obtained by combining two or more of the colors in a single zone in various proportions. In fact the combinations thus obtained are practically limitless.

While the pipes 14 are shown as entering the ducts 4 at the ends it is of course evident that they may be otherwise located with reference to the ducts and the invention is therefore not limited to the showing of the drawings in this respect, nor is the invention limited to the showing of the drawings in many other respects, since it is quite evident that the proportions and arrangements of the parts are susceptible of wide modifications.

While various modes of obtaining pressure upon the ink in the tanks 15 have been set forth, it is found in practice that air pressure is most desirable especially in connection with the follower 25, and for all practical purposes the air pump 21 may be such as is commonly used for the pumping up of pneumatic tires, a few strokes of the pump at long intervals being all that is re-

quired after the initial establishment of the pressure.

For the proper distribution of the ink, especially in the case of the table 1 shown in Figs. 1 and 2, a single pair of inking rollers is usually sufficient, but if additional rollers be found advantageous they may be provided without in any manner departing from the present invention.

Instead of using the bar 7 in the ducts 4, screw holes may be tapped in the bottom of each duct and the screw ends of the valves 10 may be inserted directly therein, as shown in Fig. 12.

What is claimed is:—

1. An ink supplying means for printing presses, having an ink receiving and transferring surface provided with a plurality of passages therethrough opening directly at the surface, each passage having an adjustable valve individual thereto and located at the discharge end of the said passage.

2. An ink supplying means for printing presses, having an ink receiving and transferring surface provided with a plurality of passages therethrough in rows, each passage opening directly at said surface and there provided with an adjustable valve individual thereto.

3. An ink supplying means for printing presses having an ink receiving and transferring surface, ink ducts adjacent thereto, and valves located in passages leading from each duct through the ink receiving surface, these valves being accessible through said surface.

4. An ink supplying means for printing presses having an ink receiving and transferring surface, ink ducts adjacent thereto and communicating each with the ink receiving and transferring surface through a plurality of passages piercing said surface, and an individually adjustable valve in each passage at the discharge end thereof.

5. An ink supplying means for printing presses comprising an ink supplying structure having an ink receiving surface and ink ducts in its body and also provided with a plurality of passages leading from each duct through and discharging at the ink receiving surface, and a valve in each passage.

6. An ink supplying means for printing presses comprising an ink supplying structure having an ink receiving and transferring surface and ink ducts in its body and also provided with a plurality of passages leading from each duct through and discharging at the ink receiving surface, and an individually adjustable valve in each passage.

7. An ink supplying means for printing presses comprising an ink supplying structure having an ink receiving and transferring surface and ink ducts in its body and also provided with a plurality of passages leading from each duct through and discharging at the ink receiving surface and an individually adjustable valve in each passage closely adjacent to said ink receiving surface.

8. An ink supplying means for printing presses having an ink receiving surface and a plurality of ink passages extending through and opening at said surface, each passage having a valve housed within the passage and closely adjacent to said surface.

9. An ink supplying means for printing presses having an ink receiving surface and a plurality of ink passages extending through and opening at said surface, each passage having an individually adjustable valve housed therein and closely adjacent to said surface.

10. An ink supplying means for printing presses having an ink receiving surface and a plurality of ink passages extending to and through said surface, each passage having an individually adjustable valve closely adjacent to said surface, said valve having a screw-threaded stem and an expanded head with the wide end of the head toward the ink receiving surface.

11. An ink supplying means for printing presses having an ink receiving surface and a plurality of ink passages extending to and through said surface, each passage being countersunk at the discharge end and there provided with a valve, the head of which latter is shaped to conform to the countersunk portion of the passage.

12. An ink supplying means for printing presses having an ink receiving surface, ducts adjacent thereto and adapted to receive inks of different colors and each connected with the ink receiving surface by a plurality of passages extending to and through said surface, and individually adjustable valves at the discharge ends of said passages.

13. An inking surface for supplying ink to the inking rollers of a printing press having a plurality of supply passages extending to and opening through said surface and an adjustable valve for each passage.

14. An inking surface for supplying ink to the inking rollers of a printing press, said surface having a plurality of series of valved ink supply passages opening therethrough and extending in a direction at right angles to the travel of the inking rollers thereover.

15. An inking surface for supplying ink to the inking rollers of a printing press having a plurality of series of valved ink supply passages extending through and opening at said surface and extending in a direction at right angles to the travel of the inking rollers thereover, the valves in the supply passages being individually adjustable.

16. An inking surface for supplying ink to the inking rollers of a printing press having a plurality of series of valved ink supply

passages extending through and opening at said surface and extending in a direction at right angles to the travel of the inking rollers thereover, the valves in the supply passages being closely adjacent to the ink receiving surface and individually adjustable.

17. An inking device for supplying ink to the inking rollers of a printing press, said device having an ink receiving surface with a plurality of series of ink supply passages extending through and opening at said surface, said passages extending in a direction parallel with the axis of rotation of the inking rollers of the press, and the said series of passages being spaced apart and parallel one with the other.

18. An inking device for supplying ink to the inking rollers of a printing press having an ink receiving surface with a plurality of series of ink supply passages extending through and opening at said surface, said passages extending in a direction parallel with the axis of rotation of the inking rollers of the press, and means for dividing the said inking surface into separate ink supplying zones.

19. An inking device for supplying ink to the inking rollers of a printing press, said device having an ink receiving surface and a plurality of series of ink supplying passages extending through and opening at said surface, said passages extending in a direction parallel to the axis of rotation of the inking rollers of the press, and means on said ink receiving surface for elevating narrow portions of the inking rollers away from the ink receiving surface on the passage of the said inking rollers over the said ink receiving surface.

20. An inking device for supplying ink to the inking rollers of a printing press, said device having an ink receiving surface with a plurality of series of ink supplying passages extending through and opening at said surface, said passages extending in a direction parallel to the axis of rotation of the inking rollers of the press and wires or strands on said ink receiving surface extending in a direction at right angles to the direction of the length of the series of ink supplying passages.

21. An inking device for supplying ink to the inking rollers of a printing press, said device having an ink receiving surface with a plurality of series of ink supplying passages extending through and opening in said surface, said passages extending in a direction parallel to the axis of rotation of the inking rollers of the press, and wires or strands on said ink receiving surface extending in a direction at right angles to the direction of the length of the series of ink supplying passages, the said wires being adjustable in the direction of the length of the series of ink supplying passages.

22. In a device for supplying ink to the inking rollers of a printing press, said device having an ink receiving surface with a plurality of series of ink supplying passages extending through and opening at said surface, said passages extending in a direction parallel to the axis of rotation of the inking rollers of the press, individually adjustable valves at the discharge ends of said passages, and means on said ink receiving surface for elevating narrow portions of the inking rollers from the ink receiving surface on the passage of the inking rollers over the said ink receiving surface.

23. An inking device for supplying ink to the inking rollers of a printing press, said device having an ink receiving surface with a plurality of series of ink supplying passages extending through and opening at said surface, said passages extending in a direction parallel with the axis of rotation of the inking rollers of the press, individually adjustable valves at the discharge ends of said passages, and wires or strands on said ink receiving surface and extending in a direction at right angles to the direction of the length of the series of ink supplying passages.

24. An inking device for supplying ink to the inking rollers of a printing press, said device having an ink receiving surface with a plurality of series of ink supplying passages extending through and opening at said surface, said passages extending in a direction parallel to the axis of rotation of the inking rollers of the press, individually adjustable valves in the discharge ends of said passages, and wires or strands on said ink receiving surface extending in a direction at right angles to the direction of the length of the series of ink supplying passages, the said wires being adjustable in the direction of the length of the series of ink supplying passages.

25. A means for supplying ink to the inking rollers of a printing press, comprising an inking surface, ink reservoirs for different inks, means for establishing a pressure on the ink in the reservoirs, conduits leading from the reservoirs to points adjacent to the inking surface, a plurality of passages leading from each conduit through and opening at the said inking surface, and an individually adjustable valve at the discharge end of each passage.

26. A means for supplying ink to the inking rollers of a printing press, comprising an inking surface, ink reservoirs for different inks, means for establishing a pressure on the ink in the reservoirs, conduits leading from the reservoirs to points adjacent to the inking surface, a plurality of passages leading from each conduit through and opening at the inking surface, an individually adjustable valve at the discharge end of

each passage, and means for segregating the inking surface into inking zones.

27. A means for supplying ink to the inking rollers of a printing press comprising an inking surface, ink reservoirs for different inks, means for establishing a pressure on the ink in the reservoirs, conduits leading from the reservoirs to points adjacent to the inking surface, a plurality of passages leading from each conduit through and opening at the said inking surface, the passages from the several conduits being grouped in series extending parallel with the axis of rotation of the inking rollers, an individually adjustable valve at the discharge end of each passage, and means for segregating the inking surface into inking zones.

28. A means for supplying ink to the inking rollers of a printing press comprising an inking surface, ink reservoirs for different inks, means common to all the reservoirs for establishing uniform pressure on the surface of the ink in the reservoirs, conduits leading from the reservoirs to points adjacent the inking surface, a plurality of passages leading from each conduit through and opening at the said inking surface, and an individually adjustable valve at the discharge end of each passage.

29. A means for supplying ink to the inking rollers of a printing press comprising an inking surface, ink reservoirs for different inks, conduits leading from the reservoirs and discharging on the inking surface, means for establishing a fluid pressure in the reservoirs, a follower in each reservoir for transmitting the fluid pressure to the ink surface, a magnet carried by the follower and a magnetic indicator exterior to the reservoir and controlled by the magnet on the follower to indicate the level of the ink in the reservoir.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ALLEN P. HARLAND.

Witnesses:

E. HUME TALBERT,

E. DANIELS.