A. P. HARLAND.

INK SUPPLYING MEANS FOR PRINTING PRESSES.

APPLICATION FILED FEB. 15, 1909.

956,083. **Patented Apr. 26, 1910.**

2 SHEETS—SHEET 1.

Fig. 1.

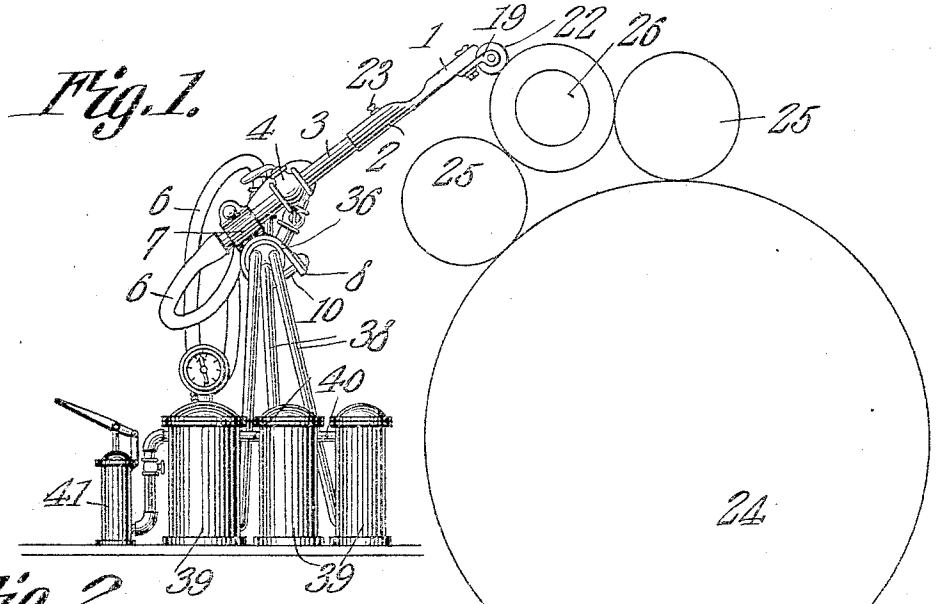
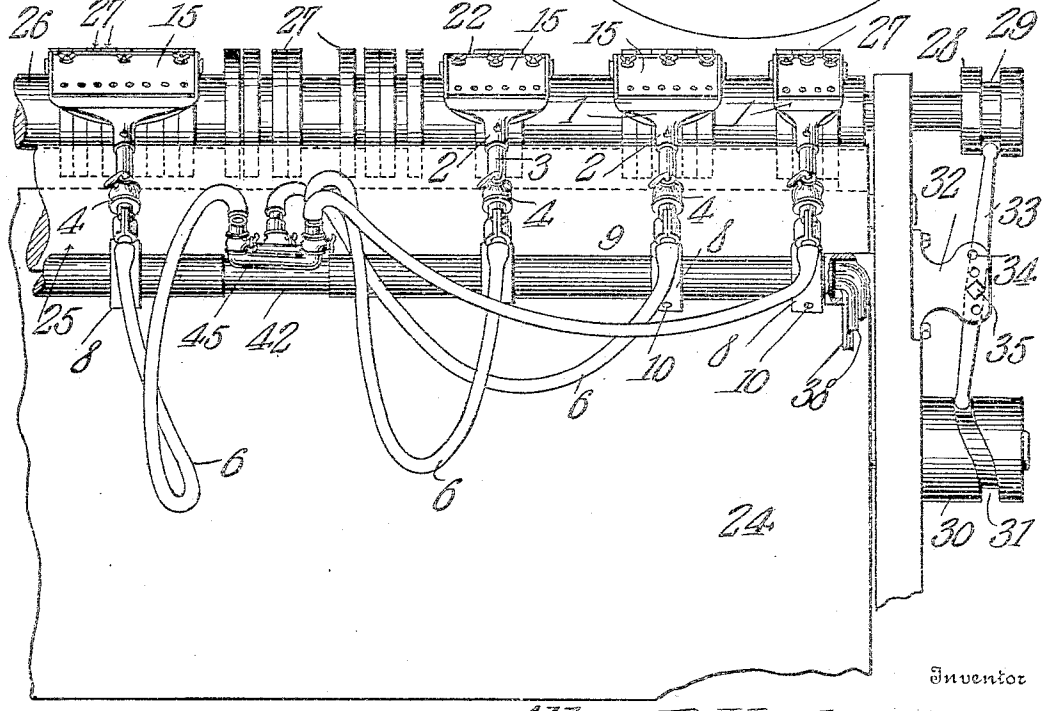


Fig. 2.



Witnesses

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2 SHEETS—SHEET 2.

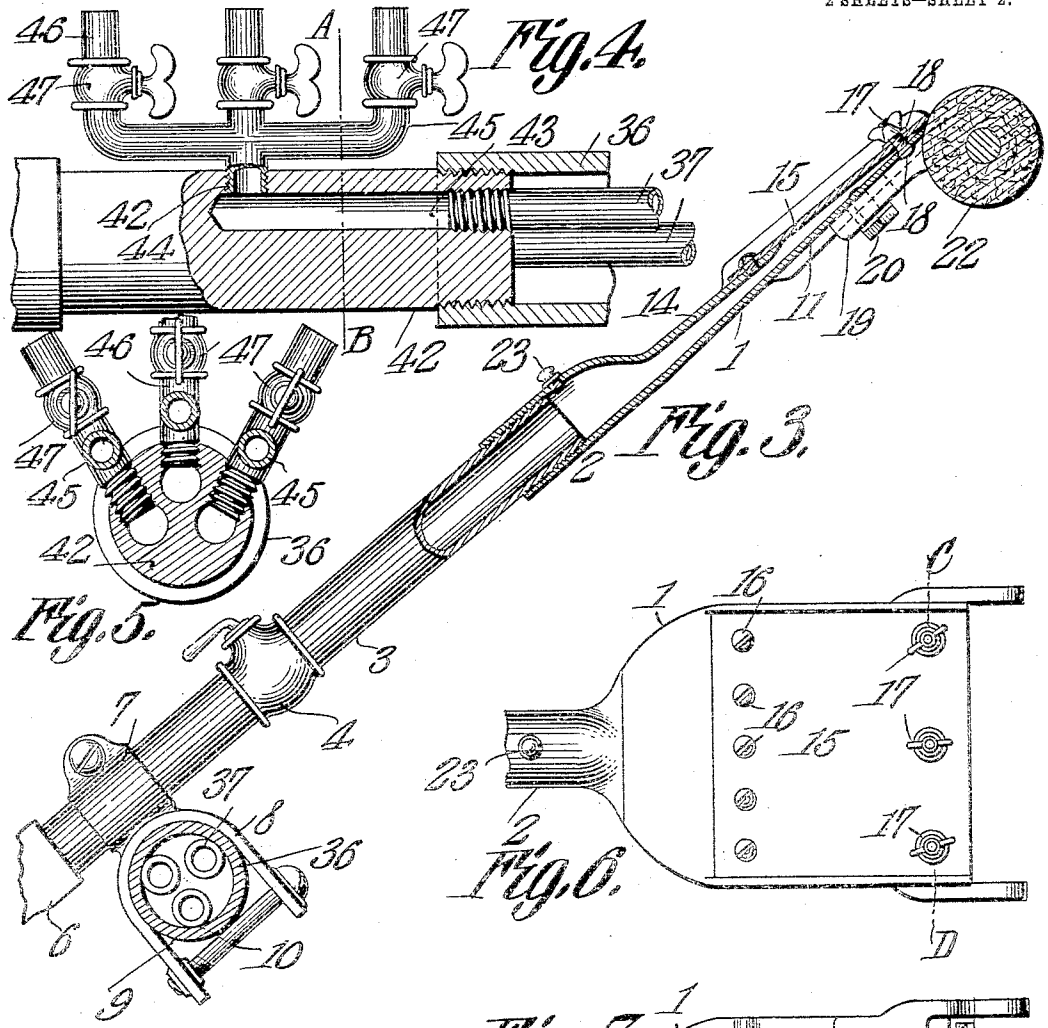

Fig. 4.

Fig. 3.

Fig. 5.

Fig. 6.

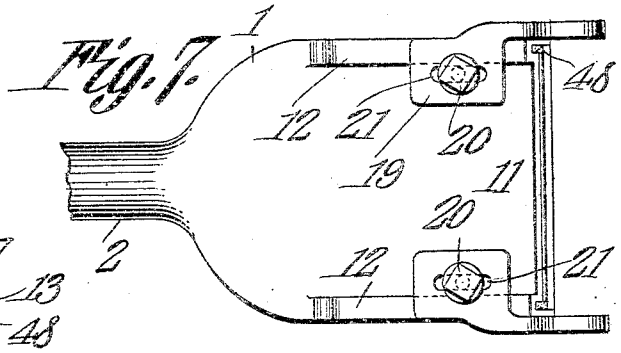

Fig. 7.

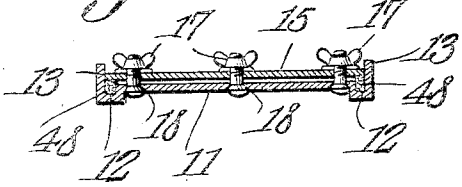

Fig. 8.

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INK-SUPPLYING MEANS FOR PRINTING-PRESSES.

956,083. Specification of Letters Patent. Patented Apr. 26, 1910.

Application filed February 15, 1909. Serial No. 477,914.

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 Ink-Supplying Means for Printing-Presses, of which the following is a specification.

This invention has reference to improvements in ink supplying means for printing presses and is designed to provide a means by which printer's ink may be fed to the ink rollers of a printing press without the necessity of the usual fountain and fountain roller and transfer roller.

The present invention is designed to provide a means for feeding the ink direct from air tight containers to the inking rollers through air-tight conduits thereby preventing fouling of the ink by dust or waste of the ink in handling or by drying by exposure.

By the present invention the flow of the ink may be readily adjusted and the ink is fed to the vibrating or non-vibrating ink rollers in a continuous film around the entire circumference of the roller instead of at a single spot as with the customary method of feeding ink.

The present invention is adapted to existing forms of presses and furthermore provides means whereby several different colored inks may be used and several different colors may be printed at the same impression without the use of separate sets of inking rollers for the separate colors. Furthermore the present invention provides means whereby the area printed in any color or the grouping of the colors may be changed at the will of the operator, and also whereby separate colors may be printed close together or may be placed one over the other to form tints.

In accordance with the present invention the ink is fed to the inking rollers in the form of a film from a device which may therefore be called a filmer and these filmers or film forming devices are made of different widths and are interchangeable one with the other and are so constructed that the width, thickness and velocity of these films delivered therefrom may be controlled at will. Because of the interchangeable feature of the filmers there is a likelihood of trapping air in the ink conduit unless provision is made to avoid such objectionable feature and the present invention includes provision for preventing the trapping of air. Furthermore, provision is made for stopping the flow of ink without altering the adjustment of the mouth of the filmer.

In addition to the foregoing the invention also comprises means for supplying ink to the surfaces to be inked in zones variable at the will of the operator from a predetermined minimum width up to any desired maximum width without the necessity of in any manner dismantling the apparatus. For this purpose the filmers are made to deliver films of ink upon a roller the active surface of which latter is made up of many narrow units which may be adjusted axially. By this means the active surface of the roller may be made up of single units or groups of any desired number of coacting units and the filmers may be used in connection with the active surfaces of the roller in any desired combination to cause the inking of the surfaces to be inked in one or more colors in any desired order or grouping.

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 an elevation, partly structural and partly diagrammatic of the invention as applied to a cylinder press. Fig. 2 is an elevation of the same with some parts shown in Fig. 1 omitted and some parts not shown in Fig. 1 illustrated. Fig. 3 is an elevation partly in longitudinal section of one of the filmer structures. Fig. 4 is a view partly in elevation and partly in section of a portion of the supporting rod for the filmers showing a means of distributing ink to said filmers. Fig. 5 is a section on the line A—B of Fig. 4. Fig. 6 is a top plan view of one of the filmer heads. Fig. 7 is a bottom plan view of the same. Fig. 8 is a section on the line C—D of Fig. 6.

Referring first to Figs. 3, 6, 7 and 8 which show the filmer structure in detail, it will be seen that the filmer comprises a head 1 formed on the end of a short tube 2 which in turn is capable of being screwed onto or unscrewed from a pipe 3 including a valve 4 and at the end remote from the pipe or tube 2 the pipe 3 is connected to a flexible tube 6. The pipe 3 is

extended through a clamp 7 on a yoke 8 adapted to embrace a rod 9 to which the yoke may be firmly clamped by a clamp screw 10 passed through one wing of the yoke and entering a suitably threaded nut or passage in the other wing. By means of the yoke 8 the filmer may be secured to the rod 9 at any point or if desired may be readily removed therefrom by taking out the screw 10, the distance between the free ends of the yoke 8 being equal to or greater than the diameter of the rod 9.

The head 1 is wide and flat as compared with the tubular portion 2 and is reduced in thickness from the said portion 2 toward the other end. One side of the head, in practice the lower side, is formed into an extended lip 11 flanked on each side by depressed channels 12 and beyond these channels formed into side flanges 13 parallel one with the other and extending above the top surface of the lip 11.

The filmer head has a top portion 14 terminating some distance back of the free end of the lip 11 and to this top portion 14 between the flanges 13 there is secured one end of a plate 15 by screws 16 or in any other suitable manner constituting a firm and non-leakable connection. The free end of the plate 15 extends slightly more than the free end of the lip 11 and near the free end of the plate 15 it is engaged by a number of thumb nuts 17 applied to screw studs 18 rising from the lip 11 and extending through suitable passages in the plate 15. Of course set screws may replace the thumb nuts 17 and studs 18 or the thumb nuts and studs may be made in one piece constituting thumb screws. The purpose of the thumb nuts or screws 17 is to provide means for moving the plate 15 so that its free end shall be in such relation to the lip 11 as to permit the passage of the film of ink of the desired thickness. Of course it will be understood that other adjusting means may be employed, but the ones described are practical. By providing several thumb nuts or screws 17 the plate 15 and lip 11 may be brought into parallel relation at different distances apart or one end may be brought into closer relation than the other or at one side of the head 1 the plate 15 may be brought into actual contact with the lip 11 while at the other side of the head it may be separated therefrom, or the center of the plate may be brought into contact with the corresponding portion of the lip and the ends allowed to remain slightly separated therefrom, or the mouth of the filmer at the free ends of the plate 15 and lip 11 may be closed at the sides and remain open at the center. By this means a film of ink may issue from the filmer either throughout the entire width of the filmer or for any desired portion of such width and the thickness of the film may be regulated at the will of the operator.

Secured to the under side of the lip 11 are brackets 19, the means of securing these brackets being in the particular illustration in the drawings, set screws 20 extending through slots 21 in the corresponding portions of the brackets so that these brackets are capable of a limited adjustment lengthwise of the filmer head 1. Journaled in the brackets 19 is a roller 22 and the adjustment of the brackets is such that the periphery of the roller is in close relation to the mouth of the filmer, the free end of the lip 11 and of the plate 15 being suitably curved to conform to the curvature of the surface of the roller 22.

The tubular extension 2 of the filmer head 1 is threaded to receive a correspondingly threaded end of the pipe 3 in order that the head 1 may be readily removed from the pipe 3 when desired. Between the threaded end of the tubular extension 2 and head 1 there is a passage through the walls of the said tubular extension normally closed by a plug 23.

The purpose of the plug 23 is to prevent pocketing of air in the filmer head or tubular extension 2 which might occur if it were attempted to unscrew the filmer head from the tube 3 when the head is full of ink, in which case the suction caused by the outward movement of the head 1 from the pipe 3 will cause an indrawing of air at the mouth of the filmer head, and if the said filmer head be screwed onto the pipe 3 when the filmer head is full of ink then there is a likelihood of pocketing air in the tubular extension 2, and should there be such a mass of imprisoned air in the filmer then when it reaches the mouth of the filmer the film will be broken and the result would be imperfect inking. These objectionable features are entirely avoided by the proper use of the plug 23. When the filmer head is removed from the pipe 3 the plug 23 is taken out from the opening into the interior of the tubular extension 2 thus admitting air and preventing the indrawing of the ink at the mouth of the film. When the head is replaced on the tube 3 then the imprisoned air finds escape through the passage unclosed by the removal of the plug 23. When the parts are in proper position the plug 23 is returned and the unintentional entrance of air at this point is then avoided.

Referring now to Figs. 1 and 2 there is shown a type or imprinting cylinder 24 engaged by the usual composition rollers 25 and in operative relation to these composition rollers is another roller 26 preferably though not necessarily a vibrating roller. Upon the roller 26 are mounted numerous rings 27 capable of being moved axially on the roller 26 to any desired extent. These

rings 27 may be in the form of split rings clamping the roller 26 with sufficient force to hold the rings in adjusted positions but not preventing such adjustment. The rings 27 are of a width agreeable to the narrowest band of color it is designed to transfer to the composition rollers 25 and by them to the printing surface on the roller 24. The peripheries of the rings 27 become the active surfaces of the roller 26 and it is the rings 27 which engage the composition rollers 25 and furthermore these rings 27 are engaged by the roller 22 of a filmer 1. The narrowest band of ink which may be transmitted from a filmer to the rollers 25 is narrower than that corresponding to the width of a ring 27 but any number of the rings 27 may be brought into side contact and thereby form a multiple ring of a width agreeable to the combined width of the rings 27 so grouped. However a filmer 1 wider than one of the smaller possible groups of the rings 27 may still be used therewith since the width of the effective delivery mouth of the filmer may be controlled by the operator by a suitable manipulation of the thumb nuts or screws 17 as already described. It will be also seen that the rings 27 may be brought into groups wherein the individual rings are close together but still separated by a slight space, or if desired a wide space and thereby bands of color may be deposited upon the type or other printing surface.

It will be seen that the invention is capable of a wide range of effect or combination and is therefore not limited to any special combination or arrangement of the parts described.

The roller 26 has been stated as being a vibrating roller although this is not necessary under all conditions. When the roller 26 is in the form of a vibrating roller then at one end of this roller there may be provided a block 28 having formed therein an annular groove 29, and upon the shaft supporting the cylinder 24 there may be another similar block 30 formed with a cam groove 31.

Between the blocks 28 and 30 there is provided a bracket 32 secured to any convenient portion of the frame of the machine and this bracket carries a rock lever 33 formed at the ends to engage in the respective grooves 29 and 31 so that the cam groove 31 will cause a rocking of the lever 33 and a corresponding axial movement of the roller 26. It is sometimes convenient to vary the degree of axial movement of the roller 26 and for this purpose the bracket 32 is provided with a series of perforations 34 and the lever 33 is provided with a similar set of perforations matching the perforations 34 so that the pivot pin 35 of the lever may be placed through any one of the series of perforations and thus the relative movement of the ends of the lever may be adjusted at the will of the operator.

The rod 9 is secured in the same frame carrying the rollers 24 and 27 and also the rollers 25 and is designed to receive the clamp members 8 of the respective filmers 1 at any position thereon. One end of the rod 9 is made in the form of a sleeve 36 while the other end of the rod may be solid. The sleeve 36 is designed to house a number of pipes 37 connected at one end of the sleeve to other pipes 38 coming from respective reservoirs 39 for the ink. These reservoirs are interconnected through connecting pipes 40 and air is supplied to the inner ends of the tanks by a suitable air pump 41, it being understood that air pressure may be replaced by any other suitable means of establishing a pressure on the ink within the reservoirs 39.

Preferably at an intermediate point in the rod 9 the sleeve 36 is connected to a reduced portion 42 of the said rod and this reduced portion is bored longitudinally for a distance, there being as many longitudinal bores as there are pipes 37 and the corresponding ends of these pipes are screwed into the bores so that they form continuations of the conduits formed by the pipes 37. Passages 44 radiate from the inner ends of the bores 43 and receive nipples on branched pipes 45 having extensions 46 each containing a valve 47. The extensions 46 are formed to receive the corresponding ends of the flexible pipes 6 or these flexible pipes may be simply slipped over the ends 46 and there held by frictional engagement or otherwise.

By providing a number of flanges to each pipe 45 it will be seen that a number of filmers may be connected to each conduit 37, 38 leading from an ink reservoir, so that several filmers may supply the same color ink if so desired and any number of points along the length of the roller 26.

The present invention is designed primarily as an attachment for a printing press designed to make imprints in black ink or any single color ink so that such a press is readily converted into a multi-color press, the type or printing surfaces on the roller or cylinder 24 being supplemental only to the main imprinting surfaces.

I have already devised a multi-color printing attachment for printing presses wherein there are provided a number of drums or cylinders 24 capable of axial and rotative adjustment and interchangeable inking units are provided whereby the imprint of different colors, interchangeable at will and usable without the necessity of cleaning large surfaces, the colored imprint being made in spaces for the purpose omitted from the main imprint. The pres-

ent invention is for the same general purpose but is more flexible and more easily operated. Moreover, the ink is applied in the form of a continuous film which may be made heavy or light at will. It is designed that each color employed shall have one or more filmers individual to the color to save the necessity of cleaning such parts of the apparatus and it will be seen that any one of the filmers may be placed at any point along the length of the roller 26 without disconnecting it from the source of ink thus enabling the operator to quickly make any combination desired, or to make quick changes in any combination already established. The invention also enables the operator to apply the color in wide or narrow bands as may be desired.

While the purpose of the invention is to provide for printing presses an attachment whereby colors, as distinguished from white and black, may be utilized particularly for the printing of bands or circumscribed areas of color, this does not preclude the use of filmers for either black or white if it be desirable to use such inks in the manner that the colored inks are used. For this reason black and white inks are to be considered, for the purposes of this case, as included among the colored inks. It is to be observed that by the use of the filmers and by the use of the rings 27, bands of ink are produced upon the inking rollers with sharply defined borders.

The line of demarcation defining the width of the band of color issuing from a filmer is rendered definite by providing packing strips 48 in the channels 12 of the lip 11. These packing strips 48 are engaged by the free end of the plate 15 and prevent the ink from spreading around the flanges 13. It is to be observed that the rings 27 do not fill up the entire length of the roller 26 and consequently these rings may be grouped at any point along the length of the roller 26, or at several points along the length of the roller 26 without the necessity of removing the roller from its journal support and only necessitating the sliding of the rings axially on the said roller to the desired positions.

While the roller 26 with its variable adjustable active surface is especially adapted for use in connection with the filmers 1 whether the latter be of constant width or of different widths, it is to be understood that the filmers may be used with other types of rollers adapted to carry the ink to the inking rollers 25. Again while the cylinder or drum 24 has been described as supplemental to the main imprinting surface, it is evident that the attachment forming the subject matter of the present invention may be used, in whole or in part, in connection with the main imprinting surface of the press. The valves 47 together with the valves 5 provide ample means for the control of the flow of ink to the filmers, but it is evident that other valves may be introduced into the conduits wherever needed.

Should it transpire that it is desirable to produce a broader band of color than can be produced by a single filmer on hand, then by virtue of the adjustability of the pipe 3 in the clamp 7 one filmer may be advanced beyond the normal position and another adjusted back of the normal position so that one filmer may over-ride the other and the two be caused to overlap to the desired extent, the two filmers being connected up to the same ink duct while rings 27 are brought together in sufficient number to produce the necessary width of surface on the roller 26 to provide the width of the band of color desired.

It will be understood that ink may be delivered to the inking rollers from the rollers 22 of the filmer without the intermediary of the distributing roller and, if necessary, means may be provided for distributing the ink on the rollers 22 before they contact with the distributing roller or the inking rollers as the case may be. It is evident that it is also possible to apply the ink from the rollers 22 directly to the type.

What is claimed is:—

1. An ink supplying attachment for printing presses comprising a filmer provided with a closed ink receiving head with a long narrow free orifice at one end adapted to extend in the direction of the inking rollers of the press and adjustable as to width and length and means for supplying ink under pressure to the other end of the head to force the ink from said orifice in the form of a continuous film.

2. In an ink supplying attachment for printing presses, a filmer comprising an ink receiving head having an inlet at one end and a long narrow free orifice at the other end, said head being expanded laterally and reduced in thickness from the inlet end toward the outlet end.

3. In an ink supplying attachment for printing presses, a filmer comprising an ink receiving head having an inlet at one end and a long narrow free orifice at the other end, the latter being adjustable as to width and length, said head being expanded laterally and reduced in thickness from the inlet end toward the outlet end.

4. In an ink supplying attachment for printing presses, a filmer comprising an ink receiving head with a long narrow orifice adjustable as to width and length and carrying a roller in adjustable relation to the orifice, and an ink transferring roller having sections of less width than the length of the filmer roller, said sections of the transfer roller being adjustable axially.

5. In an ink supplying attachment for printing presses, a filmer composed of an ink receiving head with a fixed projecting lower lip having channels formed at its sides, packing lodged in said channels, and an upper lip secured at the rear end to the head and at the front end movable to and from the lower lip and in engagement with the packing and means for adjusting the distance between the lips.

6. In an ink supplying attachment for printing presses, a filmer comprising a closed ink receiving head with a long narrow free orifice adapted to extend in the direction of the length of the inking roller of the press, means for supplying ink under pressure to the said head at the end remote from the orifice to force therefrom a continuous film of ink, and a roller on the ink receiving head having its axis of rotation eccentric to the path of the film issuing from said orifice.

7. In an ink supplying attachment for printing presses, a filmer comprising an ink receiving head with a long narrow free orifice adapted to extend in the direction of the length of the inking rollers of the press and adjustable as to its width and length, means for forcing the ink from said orifice in the form of a continuous film, and a roller carried by the filmer at the discharge end thereof and immediately adjacent to said orifice, the axis of said roller being eccentric to the path of an ink film issuing from the filmer orifice.

8. In an ink supplying attachment for printing presses a filmer comprising a closed ink receiving head with a long narrow free orifice adapted to extend in the direction of the length of the ink rollers of the press, means for supplying ink under pressure to that end of the filmer head remote from the orifice, a roller carried by the filmer head in position to receive ink from the orifice and having its longitudinal axis parallel with and eccentric to the length of the filmer orifice and adjustable to and from the same, and an ink transferring roller made up of axially adjustable sections.

9. In an ink supplying attachment for printing presses, a filmer comprising an ink receiving head with a long narrow orifice adjustable as to width and length and a roller carried by said filmer in adjustable relation to the orifice.

10. In an ink supplying attachment for printing presses, a filmer comprising an ink receiving head with a fixed projecting lower lip, an adjustable upper lip coacting with the lower lip to form a long narrow orifice, means for adjusting the upper lip to determine the size of the orifice, and a roller carried by the filmer in ink receiving relation to the orifice.

11. In an ink supplying attachment for printing presses, a filmer comprising an ink receiving head with a fixed projecting lower lip, an adjustable upper lip, the two lips coacting to form a long narrow orifice of adjustable width and length, adjustable supports carried by the filmer at the orifice end thereof, and a roller journaled in said support in ink receiving relation to said orifice.

12. In an ink supplying attachment for printing presses, a plurality of filmers each comprising an ink-receiving head with a long narrow free orifice adapted to extend in the direction of the length of the inking rollers of the press, a carrier for each of said heads, means extending in the direction of the length of the inking rollers for interchangeably supporting the filmers, and means for securing the filmers to the supporting means at any point thereon.

13. In an ink supplying attachment for printing presses, a source of ink under pressure, a supporting rod or bar extending in the direction of the length of the inking rollers of the press, conduits extending through said bar for a portion of its length and connected to the ink supply, distributing means connected to said conduit, and ink delivering means provided with means for interchangeable connection with any of the ink conduits.

14. In an ink supplying attachment for printing presses, an ink transferring roller having active portions of a predetermined minimum width and adjustable axially on the roller to different positions into and out of contact one with the other, and adjustable and interchangeable ink supplying means for delivering ink to the active portions of the ink transferring roller.

15. In an ink supplying attachment for printing presses, an ink transferring roller having active portions of a predetermined minimum width and adjustable axially on the roller to different positions into and out of contact one with the other, adjustable and interchangeable ink supplying means for delivering ink to the active portions of the ink transferring roller, and means for delivering ink under pressure to the ink supplying means.

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:
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E. DANIELS.