

June 21, 1927.

A. L. LENGEL

1,633,338

AUTOMATIC INKING FOUNTAIN FOR PRINTING PRESSES

Filed Oct. 5, 1926

2 Sheets-Sheet 1

Fig. 1.

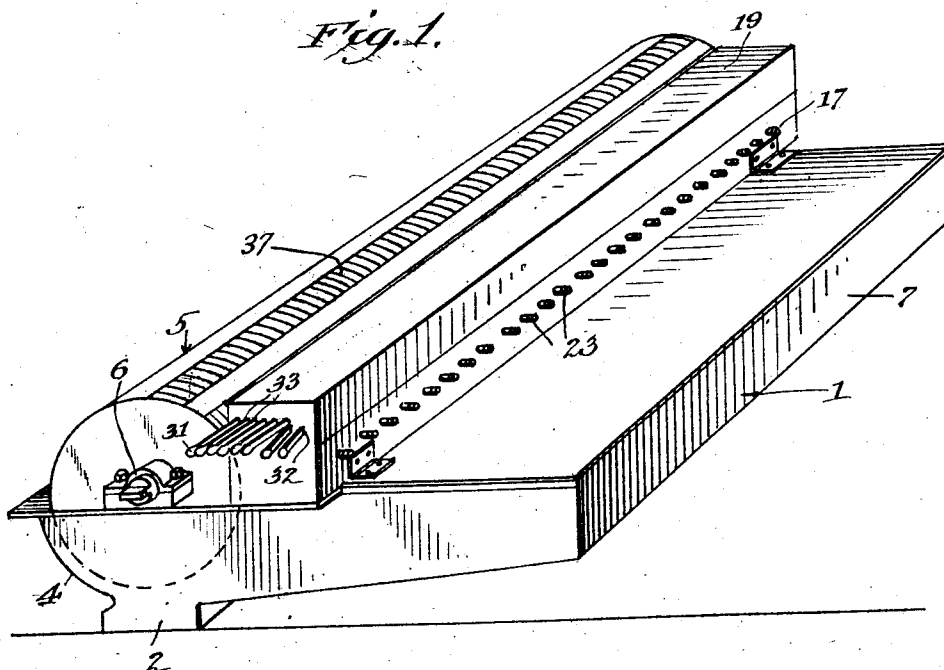
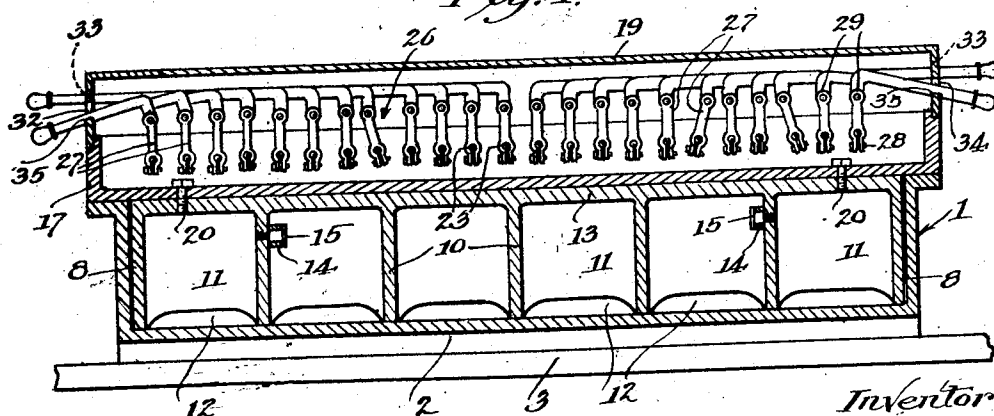


Fig. 4.



Inventor:
ALBERT L. LENGEL.
by Hazard and Miller
Attorneys

June 21, 1927.

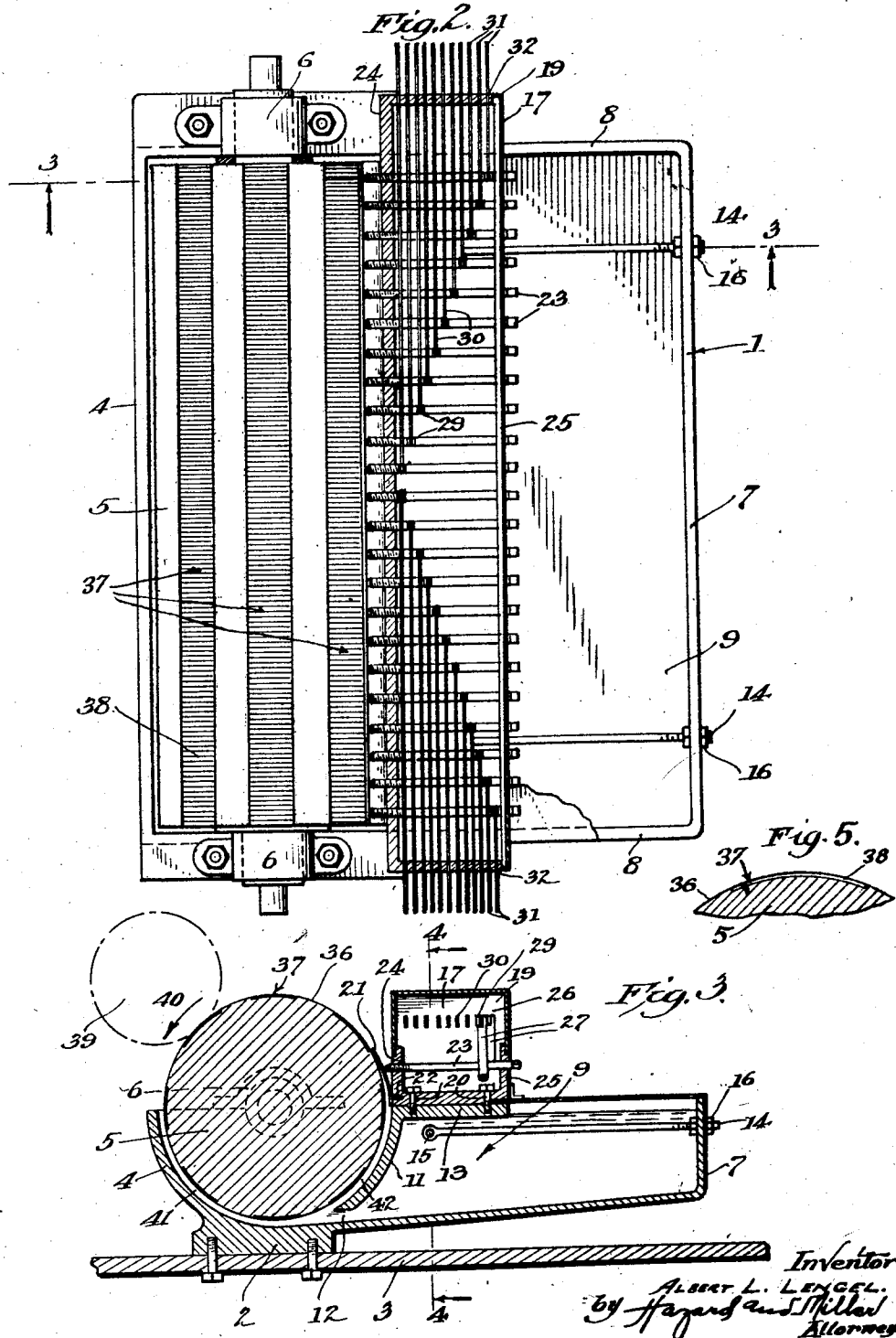
A. L. LENGEL

1,633,338

AUTOMATIC INKING FOUNTAIN FOR PRINTING PRESSES

Filed Oct. 5, 1926

2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE.

ALBERT L. LENGEL, OF BAKERSFIELD, CALIFORNIA.

AUTOMATIC INKING FOUNTAIN FOR PRINTING PRESSES.

Application filed October 5, 1926. Serial No. 139,624.

My invention is an automatic inking fountain for printing presses and in the method of inking for printing operations.

5 An object of my invention is the construction of an automatic inking fountain for printing presses in which the ink is fed by a fountain roller, this roller taking the ink from what may be termed a pressure chamber in the ink fountain, there being a distinct and separate air outlet on the other side of the fountain roller when same is in operation, and thus preventing the so-called boiling of the ink by the intermixture of air bubbles therewith conveyed to the ink by the fountain roller.

Another object of my invention is the construction and mounting of an adjustable fountain blade at the discharge end of the pressure chamber. This blade is adjusted by a plurality of alinement keys for initial adjustment and a plurality of service keys which actuate the alinement keys in order to give an accurate and varied control of the amount of ink required for different classes of printing.

Another object of my invention is the construction of a hard surfaced fountain roll with a surfacing construction whereby part of the roll functions to lift or carry the ink to the transfer roll and another portion of the surface of the fountain roll functions to convey the excess ink back from the transfer roller to the ink fountain.

Another object of my invention is the provision of packing felts or the like in the ink fountain at each end of the fountain roller, preventing flow of ink on the end of the roller.

Another object of my invention is in installing a bridge in an automatic ink fountain, this bridge being connected to the fountain in a stationary manner and forming the pressure chamber in connection with the fountain roll for feeding ink and having the fountain blade with the alinement and service keys connected thereto.

In constructing my invention I utilize an ink fountain with a fountain roller mounted to rotate with the lower portion dipping into the ink. One side of the fountain adjacent the roller is concentric therewith with a narrow passage therebetween. The bridge secured in the fountain on the other side of the roller has a concave surface concentric

with the roller and with ink passages adjacent the bottom of the fountain to the lower end of the pressure chamber formed between the face of the bridge and the roller. A separate box having the fountain blade, the alinement and service keys is mounted on top of the bridge and allows further adjustment of the fountain blade.

In connection with the feature of the fountain rollers, I use a hard surfaced roller with a series of millings which cut the surface slightly below the smooth external periphery and thus form a series of depressions in an otherwise smooth faced roll. These depressions act to pick up the ink and convey it to a transfer roller and the smooth surfaces carry back the excess of ink from the transfer roller to the ink fountain. I find it desirable to form the millings making lengthwise grooves or depressions in the fountain roller and with the slight individual corrugations formed in the millings extending in a circumferential direction.

My invention will be more readily understood from the following description and drawings, in which;

Figure 1 is a perspective view of an ink fountain with the roll and other features of my invention installed, this giving an external view;

Fig. 2 is a plan view with part of the keyboard box in section;

Fig. 3 is a vertical transverse section on the line 3—3 of Fig. 2 in the direction of the arrows;

Fig. 4 is a longitudinal sectional view of Fig. 3 on the line 4—4 in the direction of the arrows;

Fig. 5 is a detail view, showing on an enlarged scale the type of depressions formed in the fountain roll.

In the drawings, an ink fountain is designated generally by the numeral 1, having a base 2 secured to a suitable supporting structure 3. The forward wall 4 of the fountain is curved, the inner surface being concentric to the periphery of the fountain roller 5, this roller being mounted on suitable journals 6 on the fountain. The rear wall 7 of the fountain is preferably vertical as is the usual construction, as are also the end walls 8.

The bridge for forming the pressure chamber is constructed substantially as follows,

having reference particularly to Figs. 3 and 4, such bridge being designated generally by the numeral 9.

This structure has a plurality of transverse walls 10 and a front curved wall 11. The curvature of the front surface of this wall is concentric with the fountain roll and a series of openings 12 in the base of the front wall allow the flow of ink to the front surface of such wall. A top wall 13 extends lengthwise of the bridge. Adjusting bolts 14 are secured to pins 15 or the like connected to the walls 10 and by means of adjustment nuts 16 in the rear wall 7 of the fountain allow positioning of the bridge at regulatable distances from the surface of the fountain roll.

The keyboard box and the fountain blade construction are substantially as follows:

This box is designated generally by the numeral 17 and has a channel shaped box structure forming the base and a cover or lid 19. The base is secured to the top wall 13 of the bridge by bolts 20 or the like and carries a fountain blade 21 of flexible metal secured to the front lower edge of the channel by counter-sunk screws 22 or the like.

A series of alinement keys 23 are extended through the front and rear walls 24 and 25 of the channel type of box, being threaded preferably at their forward end and having square or other shaped key connections at their rear ends. These keys press on the back of the fountain blade as clearly shown in Fig. 3 and allow the adjustment of same at variable regulated distances from the fountain roller.

The service keys are indicated generally by the numeral 26 and comprise a series of levers 27, each of such levers having a split lower end with a bolt therethrough indicated by the numeral 28, allowing clamping to the stem of the alinement keys. The upper ends 29 of such levers are preferably bifurcated and attached to the key rods 30 by pins with cotter pins or the like through each end. These rods are formed L-shaped, having the handle end 31 extending through the opposite ends 32 of the keyboard box 17. There are preferably an upper and a lower set of apertures 33 and 34 through which the handles extend. The handles may be provided with notches 35 if desired to engage the edges of the apertures. On account of the large number of alinement keys required, it is desirable to have the service keys staggered and to have the keys connected to the alinement keys adjacent the ends of the keyboard box, passed through the lower apertures and the handles of the other service keys passed through the upper apertures.

The construction of the fountain roll is substantially as follows, having reference particularly to Figs. 1, 2, 3 and 5:

This roll is formed with an outer peripheral surface 36 which is smooth and with a series of depressions 37 which extend lengthwise of the roll. The number of these depressions and their width considered circumferentially of a roll may vary in proportion to the smooth portion 36 of the roll, depending on the type of work to be done. These depressions are preferably formed by milling the roll and the slight corrugations 38 formed by the milling extend in a circumferential direction. The transfer roller is indicated by the numeral 39, but does not form a feature of my present invention. It is to be understood that the ink may be conveyed from the fountain roller in any desired manner.

The operation of my automatic inking fountain for presses is substantially as follows:

It will be understood that the inking roller may be driven in any suitable manner and rotates in the direction of the arrow 40 as shown in Fig. 3. The ink which is of varied consistency according to whether black or colored inks are used, flows freely in the fountain through the openings 12 and when the fountain roll is stationary fills what may be called the air chamber 41 on the side of the roll adjacent the wall 4 and what may be termed the pressure chamber 42 adjacent the front wall 11 of the bridge. When, however, the roll is rotated in direction indicated, on account of the ink being drawn by the surface of the roll, the air chamber 41 is substantially cleared of ink and ink is forced upwardly under pressure in the pressure chamber 42 between the periphery of the roll and the forward surface of the wall 11 of the bridge. The fountain blade being adjustable allows only the desired film of ink to be conveyed by the roll and also functions to aid in maintaining the pressure in the pressure chamber.

A certain amount of air is carried by the fountain roller into the ink and air bubbles are formed therein, which bubbles have free exit through the air chamber 41 between the wall 4 and the periphery of the roller 5, thus preventing so-called boiling or churning of the ink and maintaining same substantially free of air bubbles, both in the body of the fountain and in the ink being carried upwardly in the pressure chamber to the transfer roller.

The alinement keys are preferably adjusted by a suitable key wrench or the like until the fountain blade is secured in the desired position for printing, a position which is usually predetermined before the press is operated. When it is desired to make additional adjustments by the service keys, these keys may be manually operated by actuating the handles to either tighten or loosen the alinement keys and it is obvious by the con-

struction of Fig. 4 that I may turn the alining keys through an angle of substantially 160° to 170°. By this means any parts of the fountain blade considered lengthwise thereof may be forced closer together or allowed to recede from the fountain roller as found desirable in the printing operation, and this may be accurately adjusted before a large number of papers have to be run off the press to determine the proper inking.

The manner of operation and functioning of my recess fountain roller is substantially as follows:

It is to be understood that the longitudinal depressions 37 pick up a greater amount of ink than the external smooth surfaces 36. The ink in the depressions is transferred to the transfer roller which roller is continuously conveying ink to the various parts of the press leading to the printing roll and is continuously conveying ink backwardly to the fountain. This surplus ink is taken off the transfer roller by the smooth surfaces 36 and reconveyed to the fountain, this operation being continuous and therefore allowing the proper transference of ink from the fountain and the carrying of the surplus ink back to the fountain.

The ink being transferred back from the transfer roller 39 by the fountain roller to the fountain takes the surplus ink from the transfer roller, which has not been communicated onto other rollers or the like of the printing press, back to the fountain and such ink is reworked and again used. Otherwise if this ink were not carried back to the fountain by the fountain roller adding more ink to the transfer roller this transfer roller would be carrying more ink than can be utilized.

It will be seen therefore regarding my invention as a whole, that I have provided a method and means of conveying ink from a fountain, such ink being subjected to pressure in a pressure chamber and the flow being regulated by a fountain blade, this having two types of devices for securing alinement and adjustment, also that I control the transference of ink from the fountain through the recessed fountain roller to a transfer roller and the surplus ink back to the fountain.

It is apparent that my invention may be considerably changed in general features or specific details to adapt same to different types of installations used in the printing art. Such changes however, would be within the spirit of my invention as set forth in the description, drawings and claims.

Having described my invention, what I claim is:

1. An inking fountain comprising in combination a fountain, a fountain roller mounted therein, and a structure forming a pressure chamber on one side of the roller, there

being ink passages at the base of said chamber and there being an unobstructed passage underneath the roller from the pressure chamber and on the side opposite such pressure chamber.

2. An ink fountain comprising in combination a fountain, a fountain roll journaled therein, a structure forming an ink pressure chamber adjacent one side of the roll, there being ink passages into the lower portion of said chamber, a fountain blade at the upper portion of the chamber and means to adjust the fountain blade and there being an unobstructed passage underneath the roller from the pressure chamber and on the side opposite such pressure chamber.

3. An ink fountain comprising in combination a fountain, a fountain roller journaled to dip therein, a structure forming a narrow passage at one portion of the roller to form an air passage, a structure forming a passage at another portion of the roller to form a pressure chamber, there being passages for ink into the lower end of the pressure chamber passage and there being an unobstructed passage under the roller between the air passage and the pressure chamber.

4. An ink fountain construction comprising in combination a fountain, a fountain roller journaled to dip therein, a bridge in the fountain having a surface concentric with the roller and spaced slightly therefrom to form a pressure chamber, and there being passages for ink at the base of the bridge and there being an unobstructed passage underneath the roller from the pressure chamber and on the side opposite such pressure chamber.

5. An ink fountain construction comprising in combination a fountain, a fountain roller journaled to dip therein, one side of the fountain being concentric to the roller and spaced slightly therefrom forming an air duct or passage when the roll rotates, a bridge, said bridge having a wall concentric to the roller forming a pressure chamber passage between same and the roller, there being ink passages at the base of the said wall, a fountain blade mounted on the upper portion of the bridge, and a series of threaded alinement keys operating said fountain blade and there being an unobstructed passage under the roller between the air passage and the pressure chamber.

6. An ink fountain construction as claimed in claim 5, the bridge and the fountain having interconnecting means to adjust the bridge relative to the fountain roller to vary the pressure chamber passage between the bridge and the fountain roller.

7. An ink fountain construction as claimed in claim 5, a series of service keys having levers connected to the alinement keys and key rods connected to the levers, said key

rods extending longitudinally of the fountain blade.

8. An ink fountain structure comprising in combination an ink fountain, a fountain roller journaled to dip therein, the fountain having a surface concentric to the roller and spaced a slight distance therefrom to form an air passage, a bridge adjustably mounted in the fountain having a front wall concentric to the roller forming a pressure passage, and there being inlets for ink at the base of said wall, a fountain blade, and a series of threaded alignment keys transversely of the blade positioned to actuate same.

9. An ink fountain structure as claimed in claim 8, having a series of service keys, each key having a lever, means clamping each lever to an alignment key, L-shaped key rods connected to said levers, and a key box structure having a plurality of apertures in the end through which the said key rods extend.

10. An ink fountain construction comprising in combination a fountain, a fountain roller journaled to dip therein, said roller having a series of smooth surfaces alternately with a series of depressed or recessed surfaces extending lengthwise of the roll, a bridge adjustably mounted having a front wall concentric with the roll to form a pressure passage, there being ink inlets to said passage at the base of the wall, and a fountain blade positioned above the bridge with means to control said blade.

11. An ink fountain construction as claimed in claim 10, the fountain having an inner surface concentric with the fountain roll opposite the bridge to form a passage between same and the roll for outlet of air when the roll is in operation.

12. A fountain roll having a series of smooth surfaces and depressed surfaces alternating and extending lengthwise of the roll, the depressed surfaces having a series of millings therein to aid taking up ink.

13. A fountain roll having a series of smooth surfaces on its periphery and a series of depressed surfaces alternating around the periphery of the roll, the smooth surfaces and depressed surfaces extending lengthwise of the roll, the depressed surfaces having a series of millings running in a circumferential direction to aid taking up ink.

14. The method of inking, comprising rotating a fountain roll to dip in an ink fountain, and establishing a pressure on the ink being fed from the fountain.

15. The method of inking, comprising taking up ink in a fountain by rotating a fountain roller to dip therein, exerting pressure on the ink at one portion of the roller in the fountain, and allowing escape

of air adjacent the other portion of the roller in the fountain.

16. The method of inking, comprising taking up ink by a rotating fountain roller dipping in a fountain, exerting a pressure on the ink being fed adjacent one portion of the roller, regulating said pressure and allowing escape of air adjacent the opposite portion of the roller in the fountain.

17. The method of inking, comprising taking up ink in depressed portions of a fountain roller, transferring some of said ink to the transfer roller and retransferring ink back from the transfer roller on smooth portions of the fountain roller.

18. An ink fountain construction, as claimed in claim 4, a structure having a fountain blade secured to the top of the bridge, a series of transverse alignment keys threaded in said structure to actuate said blade, a series of service keys, and means connecting same to the alignment keys, said service keys extending longitudinally of the blade holding structure and being adapted to turn the alignment keys.

19. In an ink fountain construction the combination of a fountain roller, a bridge having a curved wall spaced from said roller effecting a pressure chamber, a flexible blade mounted on the bridge and bearing against said roller, a box like structure mounted on the bridge having a series of alignment keys screw threaded in the box and adjustable to bear against the blade, a lever connected to each of the keys, and service keys attached to said levers and extending longitudinally through the box and through one end, said levers being slidable to partly rotate the alignment keys.

20. An ink fountain construction comprising in combination a fountain roller, a bridge having a curved wall, means to adjust the bridge to and from said roller, the curved wall being concentric to the roller, a box like structure and a flexible blade mounted on the bridge, a plurality of alignment keys screw threaded in the box and extending transversely therethrough to press the blade against the roller, a lever attached to each key, a service key attached to each lever and extending longitudinally through the box, said service keys partly rotating the alignment keys to adjust the blade.

21. In an ink fountain construction the combination of a fountain having a curved forward wall, a fountain roller concentric to said wall, a bridge extending longitudinally of the fountain and having a curved front wall, said front wall being concentric to the fountain roll, means to adjust the bridge relative to the roll, the space between the said curved wall and the roll forming a pressure chamber, there being an air passage between the roll and the forward wall

of the fountain, an unobstructed passage below the roll between the pressure chamber and said air passage, a flexible blade mounted on the bridge bearing against the roll, and means to adjust the pressure of the blade.

22. In an inking fountain the combination of a fountain structure, a fountain roll dipping therein, a wall structure in the fountain, means to move said wall structure to and from the roll, said wall structure and the roll forming a pressure chamber, and a passage from the fountain at the lower part of the wall to the pressure chamber.

23. In an inking fountain the combination of a fountain structure, a fountain roll dipping therein, a bridge having a curved wall, said wall extending downwardly into the fountain and following the curve of the roll, means to adjust the bridge and the wall to and from the roll to form a pressure chamber and vary the size of said chamber, and means forming a passage for ink at the lower part of said wall between the fountain and the pressure chamber.

In testimony whereof I have signed my name to this specification.

ALBERT L. LENGEL.