May 19, 1959 A. J. MUELLER 2,887,049

INK FOUNTAIN

Filed Dec. 29, 1955 2 Sheets-Sheet 1

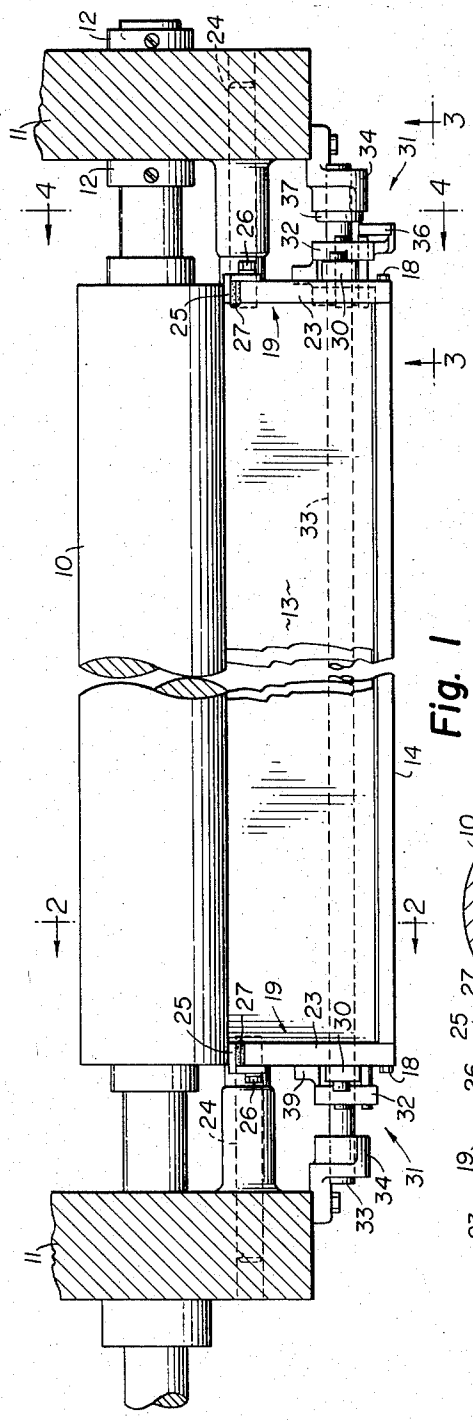


Fig. 1

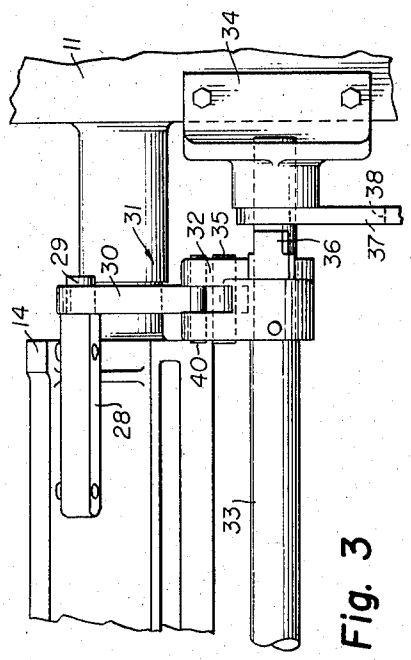


Fig. 3

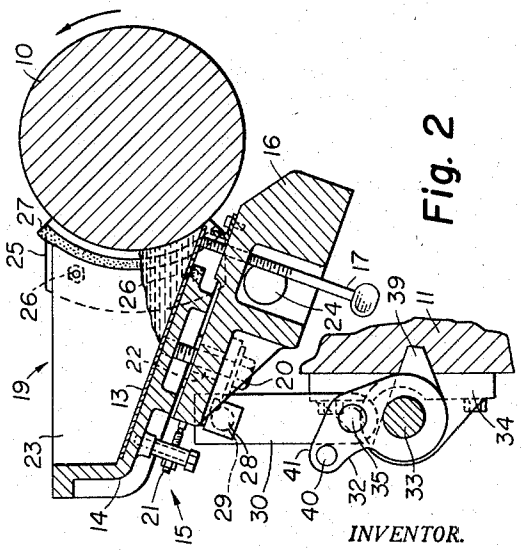


Fig. 2

INVENTOR.
ANTHONY J. MUELLER
BY William Weigl
AGENT

May 19, 1959 A. J. MUELLER 2,887,049

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Filed Dec. 29, 1955 2 Sheets-Sheet 2

Fig. 4

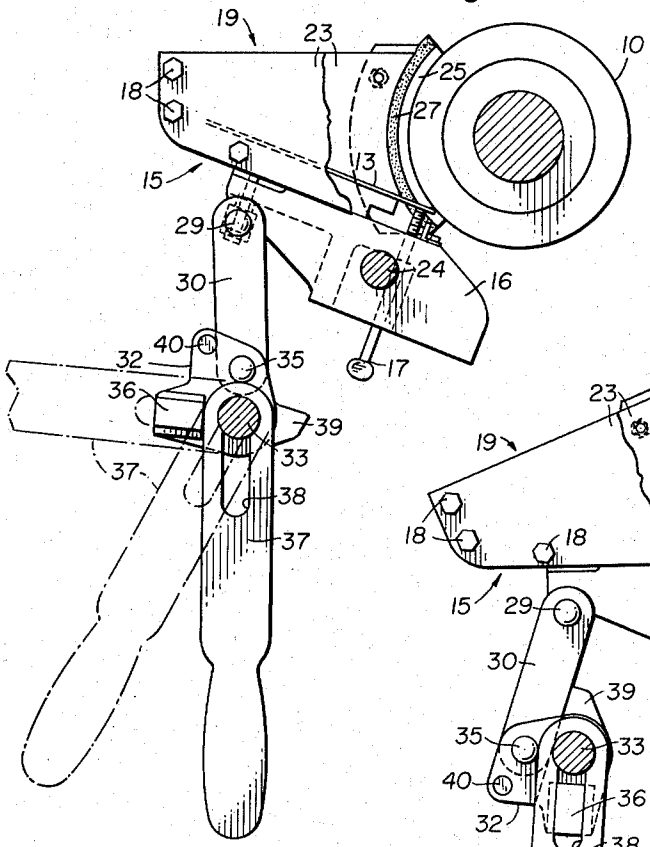
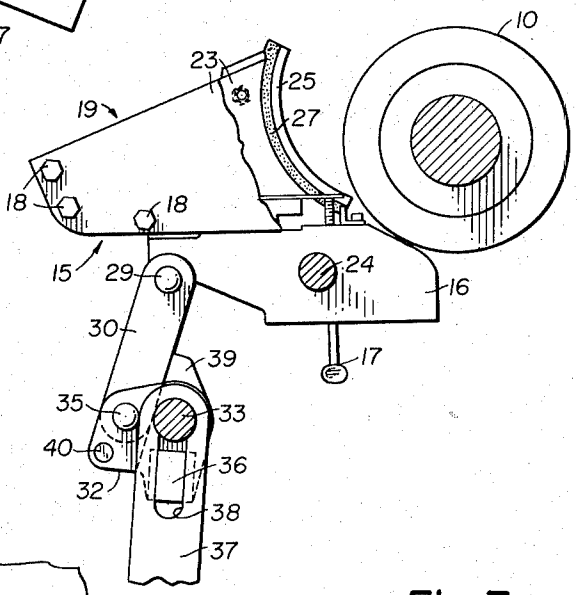


Fig. 5



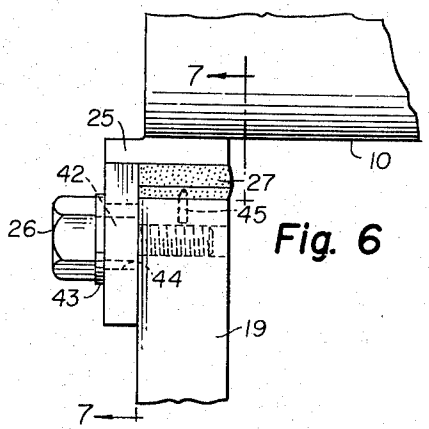
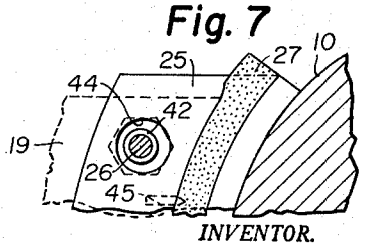


Fig. 6

Fig. 7



INVENTOR.
ANTHONY J. MUELLER
BY
William Weigl
AGENT

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INK FOUNTAIN

Anthony J. Mueller, Pawcatuck, Conn., assignor to Harris-Intertype Corporation, Cleveland, Ohio, a corporation of Delaware

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14 Claims. (Cl. 101—364)

This invention relates generally to an ink fountain for a printing press and particularly to novel means facilitating manufacture and ease of operation of the fountain to expose its parts to an operator for cleaning.

It has been customary to provide the fountain roll of an ink fountain with shoulders at its ends, against which side walls of a fountain body closely fit to seal ink in a cavity formed between the body and the roll. The fountain body of some fountains of this type is movable away from the roll or vice versa to permit an operator to gain access to the fountain blade for cleaning purposes. Others are incapable of such movement. In the case of the latter, ink which works its way between the side walls of the fountain body and the ends or shoulders of the roll cannot be easily removed. Such ink hardens upon drying, thus creating difficulty in driving the roll and possibly contributing to the breakage of parts.

To prevent ink from working its way between the side walls of the fountain body and the shoulders on the roll, it is necessary that the side walls be extremely close fitting, yet the roll must be free to revolve. This requires that the fountain body with which the side walls are generally integral or to which they are attached must be precisely manufactured and fitted by hand. Furthermore, the usual fountain blade which is supported by the fountain body and which fits up close to the roll to meter the thickness of ink thereon must be of the exact length of the roller between the shoulders. After a period of time, wear ensues between the shoulders and the side walls with which they engage. As such wear increases, the possibility of ink entering into the space between the shoulder and the side walls also increases and the problem magnifies itself. Ink is more poorly sealed in the fountain and cleaning becomes more difficult. Furthermore, when changing the ink in the fountain from one color to another, there is more possibility of color contamination if the fountain cannot be properly cleaned.

In ink fountains of the type in which the fountain body is either movable away from the roll or the roll away from the fountain body, the same problem of precision manufacturing is present. The fountain blade and the distance between the inner side walls of the fountain body must be of the exact length of the fountain roller between its shoulders. Wear in a fountain of this type results not only from use of the machine over a period of time and the presence of abrasive ingredients in the ink, but also comes about by moving the fountain body to and from operative position. Furthermore, since the side walls must necessarily tightly fit the shoulders on the roll, the mechanism for moving the fountain to and from the roller usually requires considerable leverage to operate. The fitting becomes critical since leakage must be prevented without the loss of freedom of movement of the parts.

According to the present invention, an ink fountain body is provided with side walls at its ends, each of which comprises a shoe which is resiliently urged into engagement with the periphery of the fountain roller to seal on

the roller and thereby prevent escape of ink at the sides of the fountain.

A principal object of this invention is to provide a simple, inexepnsive fountain which can be moved manually to and from a fountain roll with great ease.

Another object of the invention is to provide an ink fountain in which the precision operations in manufacturing are reduced to a minimum.

Still another object of the invention is to provide sealing means at the sides of an ink fountain body which, after use and wear of the mechanism, provide a seal as good as or better than that which it provided when the fountain was originally manufactured.

A further object of the invention is to provide a fountain body having side walls with concave surfaces engaging and thereby sealing on the periphery of the fountain roll.

A more specific object of the invention is to provide the side walls of the ink fountain body with a pair of shoes having concave portions which snugly fit the periphery of the roll, which shoes are resiliently urged into engagement with the roll, a purpose of which is to facilitate engagement and disengagement of the shoes and roll.

Still another object of the invention is to provide for compensation of wear between the roller and shoes.

Other objects and advantages will be apparent by referring to the following specification and drawings, in which

Figure 1 is a plan view of a printing press ink fountain embodying the invention,

Figure 2 is a cross-sectional elevational view taken substantially along line **2—2** of Fig. 1,

Figure 3 is a fragmental rear elevational view looking in the direction of the arrow **3** of Fig. 1,

Figure 4 is a side elevational view taken substantially along line **4—4** of Fig. 1 illustrating the operative position of the ink fountain and further showing manually operative means for moving the fountain body to and from the roller.

Figure 5 is a view similar to Fig. 4 showing the fountain body in inoperative position,

Figure 6 is an enlarged fragmentary view in plan showing a shoe of the side wall at the left side of the roller in operative position, and

Figure 7 is an elevational view in section taken substantially along lines **7—7** of Fig. 6.

Referring now to Fig. 1, a fountain roll is journaled in side frames **11** of a printing press. The roll **10** is rotated intermittently by the usual well known mechanism (not shown) such as a pawl and ratchet. Collars **12** are fixed to the right end of the roller shaft as shown in Fig. 1 to prevent axial movement of the roll.

As shown in Fig. 2, a flexible fountain blade **13** parallel to the roll **10** is inclined with respect thereto. The blade has an edge in close proximity to the surface of the roll **10** and is supported on an upper portion **14** of a fountain body **15**. The blade **13** overhangs the portion **14** where it engages the roll **10** to permit adjustment of the overhanging portion of the blade to the roll for metering the thickness of ink to be supplied from an ink supply to the surface of the roll **10**. A lower portion **16** of the fountain body **15** has threaded therein a plurality of thumbscrews **17** which are used in the usual manner for the aforementioned adjustment. The upper portion **14** of the fountain body **15** has affixed thereto by means of screws **18**, a pair of side walls **19**. Each side wall comprises a main portion **23**, and a shoe **25** and strip **27** preferably of rubber or similar material to be described shortly. It will be noticed in Fig. 1 that the blade **13** and the portion **14** of the fountain body are of the same length. In manufacturing, these two members are fastened together by suitable means and made slightly longer

than required. The two ends are then machined while the portion 14 and blade 13 are together. This procedure eliminates the necessity of later requiring hand fitting the blade 13 between the side walls 19 as is customary in conventional ink fountains. The upper and lower portions of the fountain body 15 are fixed to each other by means of bolts 20 which pass through elongated slots 22 in the lower portion 16 and are threaded into the upper portion 14. The usual adjusting screws 21 are provided for moving the balde 13 in and out by moving the upper portion 14 relative to the lower portion 16 while the bolts 20 are loose, such adjustment being permitted by the slots 22.

The fountain body 15 has its lower portion 16 pivoted at its ends on short shafts 24 carried in bosses on the side frames 11 of the press. Pivotal movement of the body 15 about the shafts 24, as will be shown later, moves the fountain body to and from operative position.

The shoes 25, preferably of brass or other bearing-like material, are carried by the main portions 23 of the side walls 19. The shoes 25 are L-shaped in cross-section, and have one surface concave and of the same radius as that of the roll 10. Each shoe 25 has a flat inner face which engages with the outer side of its respective side wall main portion. A pair of bolts 26 holds each shoe 25 against movement away from its portion 23 of the side wall. The rubber strips 27 are provided between the shoes and portions 23 and have an edge snugly fitting the end of the fountain blade to seal the space between the shoes and portion 23 at the blade. The rubber strips, when the fountain body 15 is in operative position, are compressed a small amount to urge the shoes 25 against the fountain roll and thereby provide a seal at those points. It will be noticed in Fig. 2 that both the shoes 25 and the rubber strips 27 extend below the fountain blade 13. As will be made apparent later, movement of the shoes 25 toward and away from the portions 23 of the side walls is permitted.

Fig. 3 shows a portion of the fountain body and part of the mechanism for pivoting the body 15 about the shafts 24. As the mechanism is substantially duplicated at both ends of the fountain, only one is shown and will be described. A bar 28 is fastened to the underside of the lower portion 16 of the fountain body and has a turned-down end portion 29 which serves as a pivot for a link 30 of a toggle mechanism 31. A lever 32 of the toggle mechanism 31 is fixed to a shaft 33 journaled in brackets 34 fixed to the side frames 11. The link 30 and lever 32 are connected by a pin 35 which forms the knee joint of the toggle. The lever 32 at the right hand side of the fountain is provided with a tongue 36. (See Fig. 4.) This tongue extends laterally from the lever 32 and may be integral therewith. A handle 37 is provided adjacent the tongue 36. This handle is adapted to hang freely on the shaft 33 by gravity to keep it out of the way of an operator. Whenever it is desired to move the fountain body 15 to inoperative position as is shown in Fig. 5, an operator merely turns the handle clockwise as shown in Fig. 4, and then moves it sidewise until a slot 38 in the handle engages with the tongue 36 on the lever 32. Upon such engagement, the handle may then be returned to its original position and in so doing, the levers 32 move the pins 35 to the left so as to break the toggle connection. The fountain body 15 thus pivots about the short shafts 24 and the fountain is opened for cleaning. It will be noted in Fig. 5 that the lever 32 has integral therewith an abutment 39, which, when the fountain is in inoperative position, engages the back side of the link 30 and thus acts as a stop for limiting the movement of the fountain body in that direction.

When the fountain body is to be returned to its original operative posiiton, the handle 37 is again turned clockwise while engaged with the tongue 36 to cause the knee joint to move slightly past toggle position as is shown in Fig. 4. In such location, the fountain blade 13 returns to its identical original position and the shoes 25 fit snugly against the periphery of the roller 10 due to the compression of the rubber strips 27. Pins 40 carried by ears 41 on the levers 32 limit the movement of the toggle mechanism to the right as viewed in the drawings by engaging the links 30 when pins 35 are slightly past toggle. It should be understood of course, that when moving the shoes up against the fountain roll 10 the rubber strips 27 must necessarily be compressed slightly before arriving at toggle position, and then, when going past toggle position a slight amount in order to lock the fountain body in the correct location, the amount of compression is decreased slightly. The loss of compression over toggle is insignificant, and the shoes 25 are thus urged into firm sealing contact with the roll 10.

Referring now to Figs. 6 and 7, which are enlarged views showing the means for permitting relative movement between the shoes 25 and portions 23 of side walls 19, it will be seen that the bolts 26 have shoulders 42. When the bolts 26 are tightened, the shoulders 42 engage the portions 23. The distance between the shoulder 42 and head of each bolt is a very small amount greater than the thickness of the portion of the shoe 25 through which it passes combined with the thickness of a washer 43 provided for each bolt. When bolts 26 are fastened in position, movement of the shoes outwardly is possible only to the very smallest degree. Holes 44 are provided in the shoes 25 to permit passage of the bolts 26 through them. The holes 44 are of a larger diameter than the shanks of bolts 26 to permit movement of the shoes in line with the side walls.

It will be noticed in Fig. 6 that each rubber strip 27 is slightly bulged inwardly of the fountain body. This is desirable to insure sealing of the rubber strips at the ends of the blade 13. Small pins 45 may be mounted in the main portions of the side walls 19. These pins may be few in number and are preferably provided with points which dig into the rubber strips 27 to prevent them from dropping out from between the shoes 25 and portions 23. Other means of retaining the rubber strips 27 in position are possible.

When the operator desires to clean the fountain, he first removes all the ink he possibly can with a spatula or other tool. Next, he takes the handle 37 which is hanging on the shaft 33 as shown in Fig. 4, turns it upwardly in a clockwise direction, moves it sidewise until the slot 38 engages over the tongue 36, and then turns the handle counterclockwise back to the position shown in Fig. 5. This breaks the toggle connection and moves the fountain body to the Fig. 5 position. The operator now has full access to all the parts of the fountain which need cleaning. After cleaning, the fountain may be left open until ink is again to be placed in it. A reversal of the steps just recited will return the fountain body to its original position.

Various modifications of the invention may be made without departing from the spirit and scope thereof.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

What is claimed is:

1. An ink fountain for a printing press comprising a rotatable fountain roll, a flexible blade parallel to said roll having an edge thereof in close proximity to the roll and being inclined with respect to said roll to form a cavity for receiving an ink supply, a body member movable to and from operative position, said blade being mounted on said body member, means on said body member for flexibly adjusting the blade relative to the roll for metering the thickness of ink applied to said roll, side walls carried by said body member and having inner faces perpendicular to the blade in sealing engagement with the ends of said blade, said side walls also having concave portions accurately fitting the periphery of said roll to seal thereon and maintain ink in said cavity, and means resiliently urging the concave portions of said side

walls into snug sealing engagement with said roll when said blade is in metering position with the roll.

2. The invention of claim 1 wherein said resilient means comprise strips of rubber or the like between and in sealing engagement with the concave and main portions of said side walls, and wherein means is provided for manually moving said body member, blade and side walls to and from the roll as a unit.

3. The invention set forth in claim 2 wherein the means for manually moving the unit to and from said roll comprises toggle mechanism which locks the unit in operative position when slightly past toggle position, in which position said rubber strips are compressed an amount sufficient to urge the concave portions against the roll in ink sealing engagement therewith.

4. In an ink fountain for a printing press, a rotatable fountain roll, a flexible fountain blade parallel to and extending substantially the length of said roll, said blade having an edge thereof flexibly adjustable relative to the roll and in close proximity to said roll below its axis for metering the thickness of ink applied to said roll and said blade being inclined upwardly from said roll to form a cavity for the reception of an ink supply, a body member supporting said blade and having side walls closely fitting the ends of the blade, each side wall comprising a shoe having a concave surface accurately fitting the periphery of said roll in ink sealing engagement therewith and extending upwardly from the metering point of said blade and roll, and a rubber strip resiliently urging each of said shoes into snug fitting contact with said roll to form a seal at each end of the cavity to prevent leakage of ink therefrom, said side walls, shoes, and resilient means being in ink sealing engagement with the ends of said blade and being perpendicular to the blade to permit adjustment thereof relative to the body member and roll while maintaining the ink sealing relationship of the several parts.

5. An ink fountain as set forth in claim 4 wherein said member and with it said blade, side walls, and shoes may be moved laterally from said roll to facilitate cleaning by permitting access thereto, means being provided to hold said shoes to said side walls during the time the member is away from the roll.

6. The invention set forth in claim 4 including a toggle linkage provided at each end of the body member for moving the member and its associated parts into and out of operative position, said linkages maintaining the blade and shoes in metering and sealing positions respectively when the knee joint of the toggle linkage is slightly past toggle position, said rubber strips being adapted to be sufficiently compressed when the parts are in operative position to maintain the shoes in snug sealing engagement with the roll, and means interconnecting the linkages for operating them simultaneously.

7. In an ink fountain for a printing press, a rotatable fountain roll, a flat, flexible blade parallel to said roll, said blade having an edge thereof in close proximity to said roll below its axis for metering the thickness of ink applied to said roll and said blade being inclined upwardly from said roll to form a cavity for an ink supply, a body member supporting said blade, means on said body member and engaging the edge of the blade for flexibly adjusting the edge to the roll, said member having side walls fixed thereto which side walls closely fit the ends of the blade, each side wall comprising a solid shoe having a concave surface adapted to closely fit the periphery of said roll, said shoes extending around said roll from below said blade to a point above the top level of ink to be carried in the cavity, means providing a seal at each end of said blade between the shoe and the main portion of the side wall resiliently urging each shoe into snugly fitting contact with the fountain roll when in operative position, and means retaining said shoes against movement outwardly from the main portions of said side walls

while permitting limited movement in a direction relative to said roll.

8. The invention set forth in claim 7 wherein the shoes are L-shaped in cross-section with the inner face of each arm of the L engaging the outer face of its side wall and wherein the means for retaining the shoes against outward movement while permitting movement relative to the roll comprises shouldered bolts threaded into the side walls and oversized holes in the arms of the L of said shoes through which holes said bolts pass, said oversized holes permitting relative movement between the shoes and side walls when the rubber is compressed.

9. The invention set forth in claim 7 wherein said body member is pivoted about a fixed axis outwardly from the point at which the blade contacts the roll, and wherein manually operative means is provided for pivoting said fountain body to inoperative position to expose the blade and roll for cleaning.

10. The invention set forth in claim 9 wherein the manually operative means comprises a pivotal shaft on a fixed axis, said shaft being parallel to said roll, toggle mechanism at each end of the shaft, each of which toggle mechanisms comprises a lever fixed to the shaft and a link pivoted to said body member, the link and lever of each pair being pivotally connected at the knee joint, said knee joint being slightly past toggle position when the fountain is in operative position, and means for pivoting said shaft to simultaneously break both of said toggles to move said fountain to inoperative position.

11. The invention set forth in claim 10 wherein a lever of one of the toggle mechanisms comprises a tongue extending laterally therefrom and radially from said shaft, and wherein an operating handle is freely pivotally hung on said shaft, said handle being slidable along said shaft and having a slot therein mating with the tongue on said lever whereby the handle may have its slot engage said tongue to move the body member and associated parts to or from the roller when the handle is pivoted, or may be disengaged from the tongue and hung freely on said shaft.

12. In an ink fountain for a printing press, a rotatable fountain roll, a fountain body having side walls thereon, a flexible blade carried thereby bearing against said roll, the side walls of said body having forward edges with a curvature similar to that of the roll, rigid shoes having curved forward surfaces conforming closely with the curvature of the roll and adapted to bear thereupon, said shoes being carried by the side walls of the body, a resilient strip interposed between the forward edge of each side wall and the corresponding shoe, and means for mounting said body to swing about an axis parallel to the roll and closer to one end of said shoes than to the other end thereof, said resilient strips projecting laterally inward beyond said shoes and contacting the side edges of the blade to seal the joints between the blade and the shoes.

13. An ink fountain substantially as defined in claim 12, comprising mechanism for moving the body toward and away from the roll, said mechanism embodying toggle means adapted to compress said flexible strips slightly as the toggle means moves to toggle-on position.

14. An ink fountain for a printing press comprising a rotatable fountain roll, a flexible blade parallel to said roll having an edge thereof in close proximity to the roll and being inclined with respect to said roll to form a cavity for receiving an ink supply, a body member, said body member and roll being relatively movable between operative and inoperative positions, means for flexibly adjusting the blade relative to the roll for metering the thickness of ink applied to the roll, said blade being mounted on the body member, side walls carried by the body member and having inner faces perpendicular to the blade in sealing engagement with the ends of said

blade, said side walls also having concave portions accurately fitting the periphery of said roll to seal thereon and maintain ink in said cavity, and means resiliently urging the concave portions of said side walls into snug sealing engagement with said roll when said blade is in metering position with the roll.

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