

[54] **INK FOUNTAIN TROUGH WITH SEALS FOR FOUNTAIN ROLLER**

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[22] Filed: **Apr. 4, 1972**

[21] Appl. No.: **241,023**

[52] U.S. Cl. .... **101/363, 101/365**

[51] Int. Cl. .... **B41f 31/02**

[58] Field of Search ... 101/363, 148, 350, 364, 365, 101/207, 208, 210, 340, 344, 347, 330, 355, 356, 360

## References Cited

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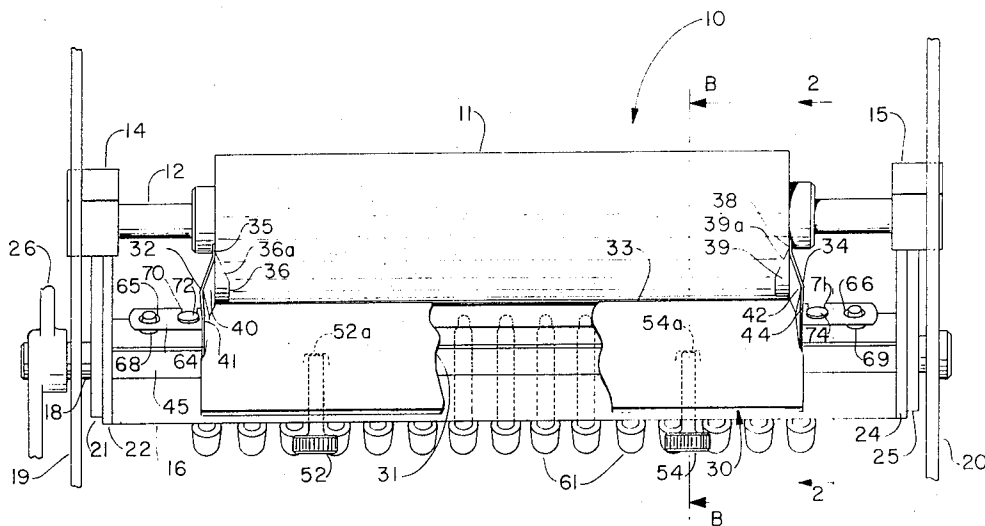
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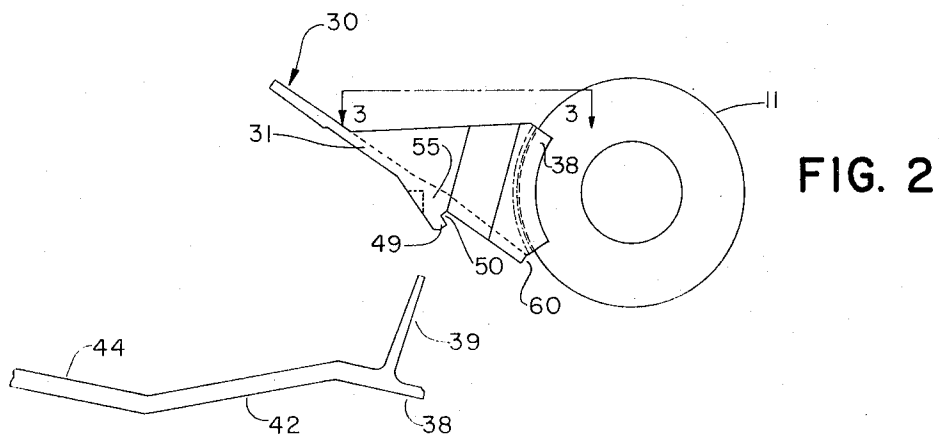
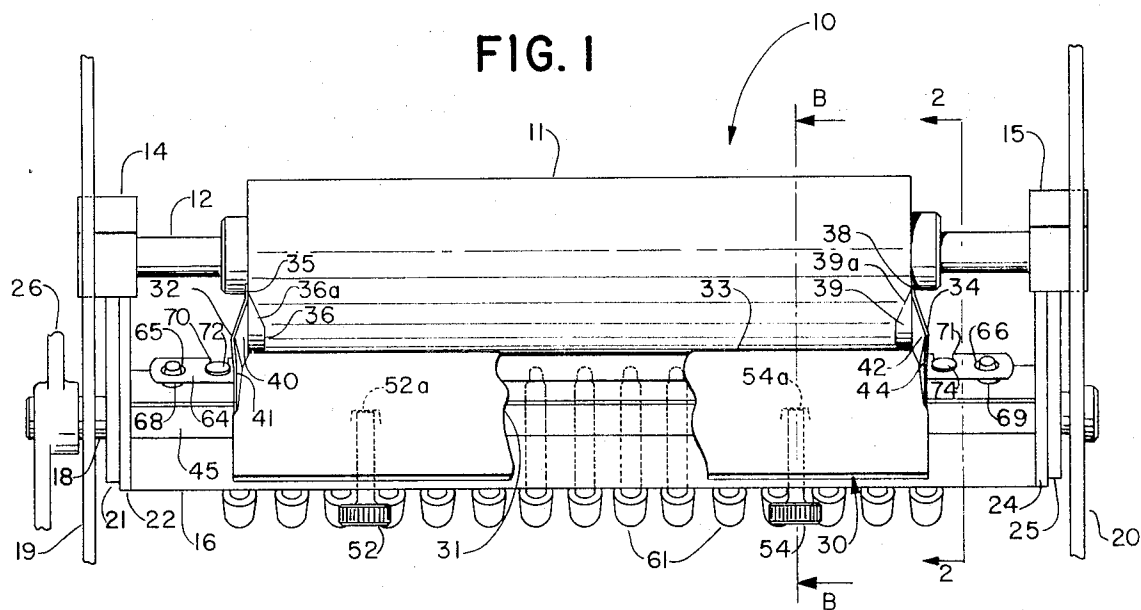
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## ABSTRACT

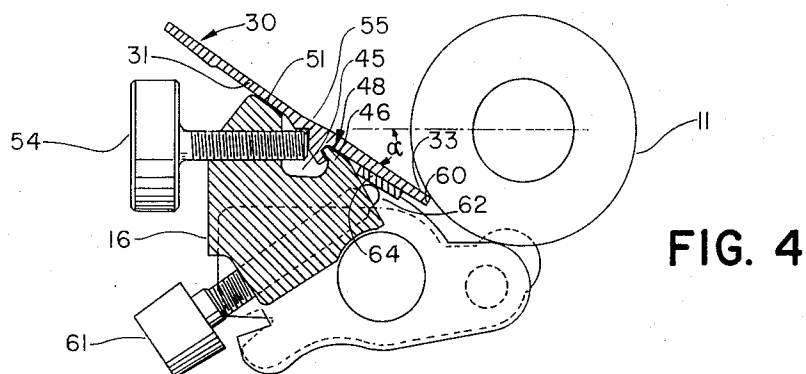
The present invention relates to a replaceable and disposable ink fountain which can be manufactured of thermoplastic material, for example, and which is constructed as a one-piece item having edge and peripheral seals to engage an ink fountain roller in a sealing manner, and also a blade edge adjustable relative to the ink fountain roller to meter application of ink to the roller.

**5 Claims, 4 Drawing Figures**





**FIG. 3**



# INK FOUNTAIN TROUGH WITH SEALS FOR FOUNTAIN ROLLER

## BACKGROUND OF THE INVENTION

Disposable liners and cartridges for inking fountains in offset duplicating machines have received extensive attention in the prior art. For example, U.S. Pat. No. 3,318,239 shows a disposable and replaceable ink fountain liner made of polyethylene used to cover the ink fountain bottom. Also, U.S. Pat. No. 2,382,103 shows a disposable and replaceable ink fountain liner made of a copolymer of vinyl chloride and vinyl acetate, again to cover the ink fountain bottom.

A. B. Dick Company, assignee of the present invention, owns U.S. Pat. No. 3,556,008 for a disposable ink cartridge. The problem which was not faced by any of the disposable and replaceable ink fountain devices shown in the prior art, was to make all of the ink contacting parts of the fountain as one replaceable piece and also to provide structure in the one piece to prevent leakage about the roller ends and allow effective metering of ink application to the fountain roller.

## OBJECTS AND SUMMARY OF THE INVENTION

Accordingly, it is an overall object of the present invention to provide a disposable and replaceable one piece ink fountain that protects all other parts of the ink fountain, apart from the roller, from coming in contact with the ink, as well as preventing leakage about the roller ends and allowing accurate metering of ink to the fountain roller.

It is a further object of the present invention in accordance with the above to provide a disposable and replaceable ink fountain that is economical to manufacture, easy to use and a desirable convenience for operators of offset duplicators.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a pictorial representation of an ink fountain embodying the present invention;

FIG. 2 is a section taken along line 2—2 in FIG. 1 and enlarged;

FIG. 3 is an enlarged fragmentary view taken along line 3—3 in FIG. 2; and

FIG. 4 is a section taken along line B—B in FIG. 1.

Turning to the drawings, there is shown an ink fountain assembly 10 embodying the present invention. The inking assembly includes an ink fountain roller 11 having a centrally located shaft 12 rotatably supported at its opposite ends in bearing blocks 14 and 15. The ink fountain roller can be driven by any of several well known methods in the art, for example by a ratchet drive mechanism which imparts an intermittent movement to the fountain roller 11. Mounted adjacent to the fountain roller 11 and extending substantially parallel thereto is an ink fountain base 16 carried by a shaft 18 extending therethrough and supported at the opposite ends by frame members 19 and 20. The ink fountain base is provided with respective pairs of plates 21, 22, and 24, 25 at its opposite ends to support the bearing blocks 14 and 15. As is described in greater detail in a co-pending application titled: Improved System for Cleaning Rollers of a Duplicating Machine, Such As Ink Rollers, U.S. Ser. No. 241,024, filed Apr. 4, 1972 and assigned to A. B. Dick Company, the assignee of

the present invention, a lever 26 carried on one end of shaft 18 is operative to pivot the ink fountain base 16 and the plates 21, 22, 24, 25 to raise and lower the bearing blocks 14 and 15 and therewith the fountain roller 11.

In accordance with the present invention a disposable and replaceable ink fountain 30 is releasably mounted on the ink fountain base 16. As exemplarily shown the ink fountain 30 creates a trough when mounted on the base 16 so as to maintain a supply of ink in contact with the roller 11. The fountain 30 includes a bottom portion 31 and opposite side walls 32 and 34.

It is one of the features of the present invention that the side walls include structure to engage the ends of fountain roller 11 so as to prevent any leakage of ink from a well 33 adjacent to the fountain roller. To that end, the exemplary side wall 32 includes both an edge sealing portion 35 and an arcuate peripheral sealing portion 36 though either one alone would operate. At the opposite end of roller 11 the side wall 34 includes similar edge sealing portion 38 and an arcuate peripheral sealing portion 39. In order to assure that the inwardly extending peripheral sealing portions 36 and 39 fit tightly about the periphery of roller 11, the radius of the distal ends of these arcuate portions is slightly smaller than the radius of the peripheral portion of the roller and they are inclined toward the roller surface relative to the edge portions 35 and 38. Accordingly, the arcuate peripheral portions 36 and 39 will flex to fit tightly about the roller 11. In order to permit the edge and peripheral seals to flex even though they are an integral part of the side walls 32 and 34, the latter are preferably constructed so as to continually bias the seals toward the roller. The bias is provided by including the ability to flex in the side walls and that is attained by forming wall 32 with a planer portion 40 disposed at an angle with respect to another integral planer portion 41. Side wall 34 is provided with similar angularly disposed planer portions 42 and 44. Accordingly, the side walls 32 and 34 flex and act like the walls of a bellows in order to bias the seals so that they engage the opposite ends of the fountain roller 11 in a cupping like manner. The exemplary peripheral seals are provided with cutouts 36a and 39a to allow ink to work or flow away from the extreme ends of the roller 11 thereby reducing the possibility of ink leakage at roller 11 ends, yet allowing full width of ink application to printing area.

It is a further feature of the present invention that the ink fountain 30 is easily mounted in position adjacent the fountain roller 11. To that end, the ink fountain base 16 is provided with a longitudinally extending groove 45. As a part of one wall defining the groove 45, the ink fountain base 16 includes a ledge 46. To matingly engage the ink fountain base, the underside of the ink fountain 30 includes the longitudinally extending hook 48 including a tongue 49 and a recess 50. The ink fountain base 16 includes an angularly disposed top surface 51 inclined to facilitate sliding of the fountain hook assembly 49 into engagement with the ledge 46. Once the fountain 30 is slipped into place a pair of thumb screws 52, 54 can be tightened into detents 52a, 54a provided in the ink fountain to anchor the ink fountain 30 in position. As shown in FIGS. 2 and 4 the ink fountain bottom 31 is provided with a central body portion 55 which is of greater thickness in the area

where the thumb screws 52 and 54 engage the ink fountain detents in the ink fountain. It has been found that flexing of the fountain blade is facilitated as explained subsequently, by having the ink fountain central body portion thicker at that point.

It is yet another feature of the present invention that a blade edge portion 60 can be accurately adjusted relative to the fountain roller 11 peripheral surface so as to allow a precisely controlled quantity of ink to be picked up by the roller 11. In the exemplarily embodiment the ink fountain base 16 includes a plurality of metering screws 61. These are oriented angularly with respect to the bottom of the ink fountain blade portion 60 and include a blunt end 62 for engaging a backing plate 64. The latter extends longitudinally underneath the blade edge 60 and is mounted on the ink fountain base 16. As exemplarily shown the backing strip 64 includes apertures 65 and 66 at its opposite ends for receiving posts 68 and 69 carried by the ink fountain, as well as retaining slots 70, 71 which are adapted to slip into grooves provided on respective posts 72, 74, also carried by the ink fountain base. As can be appreciated by viewing FIG. 1, the backing strip 64 can be installed by flexing the opposite ends of the strip above the height of the posts 68 and 69 so as to engage the strip slots 70 and 71 with the grooved posts 72 and 74 and once the engagement is effected permitting the backing strip ends to spring over the respective posts 68 and 69 locking the backing strip 64 in place. Though in the present instance 15 adjusting screws are shown for obtaining the desired flexing in the blade edge 64 to meter ink onto roller 11, a different number may be employed depending on the accuracy that is desired in applying ink to the roller. In one practical instance the backing strip 64 is spring steel used to support the ink fountain and to bridge the gaps between adjusting screws 61.

It has been found that a material which can be used for the ink fountain is Dupont Delrin 500, as it is flexible and resistant to the corrosive action of solvents and printing inks. On the other hand, it does have a stiffness so as to be effective to maintain a leak-free fit about the roller ends, and be positionable relative to the roller along the blade edge to effectively meter ink. It has also been found that certain dimensional selections using Delrin 500 give good results. For example, if the top of the ink fountain base 16 is inclined with respect to the horizontal at an angle  $\alpha$  as shown in FIG. 4 of approximately 35 degrees the ink fountain can be easily inserted, and it also can be removed while partially filled with ink in a sliding and pivoting action so as to wipe the surface of the ink fountain, and thereby prevent undesired release or spillage of the ink. The angle of approach of ink fountain 30 to roller 11, and adjusting screws 61 is such, so as to allow the ink fountain to be removed and replaced without disturbing the ink flow adjustment of the adjusting screws. Other dimensions which have given desired results are a thickness of about 0.020 inches for the edge seal 38, a generally tapering form for peripheral seal 39 with a distal end thickness of about 0.010 inches, and a wall thickness for planar portions 42, 44 of about 0.030 inches.

It has also been found that metering of ink can be effectively accomplished with screws 61 by forming the fountain bottom central body portion 55 thicker, for example at least 0.075 inches thick, and tapering from the central body portion 55 to the distal end of blade 60, the blade distal end having a thickness of at least

0.035 inches. In a practical example the blade extends approximately an inch beyond the central body portion.

It will be appreciated by those skilled in the art using the teachings of the present invention that selections and adjustments can be made as to the materials used, the shapes used, and the dimensions used that vary from that given above. The objective is to make a one-piece ink fountain out of a low cost material such as a thermoplastic that is formable and flexible to provide the necessary seals, yet sufficiently stiff to allow effective metering of ink application to the fountain roller.

While we have described my invention in connection with one specific embodiment, it is to be understood that this is by way of illustration and not by way of limitation and the scope of my invention is to be defined by the appended claims which should be construed as broadly as the prior art will permit.

We claim as our invention:

1. An ink fountain assembly including an ink fountain roller rotatable about an axis and an inking trough positionable adjacent the roller for supplying ink to the roller, the combination comprising a support mounted on the frame for receiving the trough, said trough including a blade and a pair of sidewalls with seals for intimately engaging opposite ends of the roller to prevent ink leakage, said blade, sidewalls, and seals joined together to define an ink well adjacent the fountain roller each of said sidewall seals including an edge portion disposed generally transversely to the axis of the roller and a peripheral portion disposed generally parallel to the axis of the roller, said seal peripheral portion extending inwardly from said edge portion and being inclined with respect to said edge portion toward the roller surface and having an arcuate shape with distal ends thereof of a slightly smaller radius than that of the ink fountain roller periphery to make a leak-free engagement with the ink fountain roller, said support including a base for supporting the trough adjacent the fountain roller and at a predetermined angle with respect to a horizontal plane through the fountain roller axis, a lock for releasably receiving a complementarily formed trough portion once the latter is positioned, and selectively operable means for adjusting the gap between an edge of said blade and the fountain roller to control ink feed to the latter.

2. The combination of claim 1 wherein said trough includes a depending angularly disposed locking lip and said support includes a complementarily formed projecting ridge for receiving said lip and a releasable anchor to lock said lip and ridge together once the trough is mounted on the support.

3. The combination of claim 2, wherein said blade forming the trough bottom includes a generally central body portion from which extends said blade edge and said locking lip, said body portion in the region of said locking lip having a thickness of at least 0.075 inches and said blade edge having a thickness of at least 0.035 inches with said body portion always thicker than said blade edge so that there is a taper in the blade between the body portion and the edge portion.

4. The combination of claim 1, wherein a thin metal backup member is interposed between said adjusting screw ends and a backside of said blade to permit adjustment of the blade edge with respect to the ink fountain roller.

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5. The combination of claim 1, wherein each of said sidewalls is formed by a pair of integral planar wall portions joined together so that the ink retaining internal wall surfaces subtend an angle other than 180 degrees

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for allowing each of said sidewalls to flex bellows-like to assure a leakage-free tight fit between said seals and said fountain roller ends.

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