

- [54] **INK FOUNTAIN IN PRINTING PRESSES**
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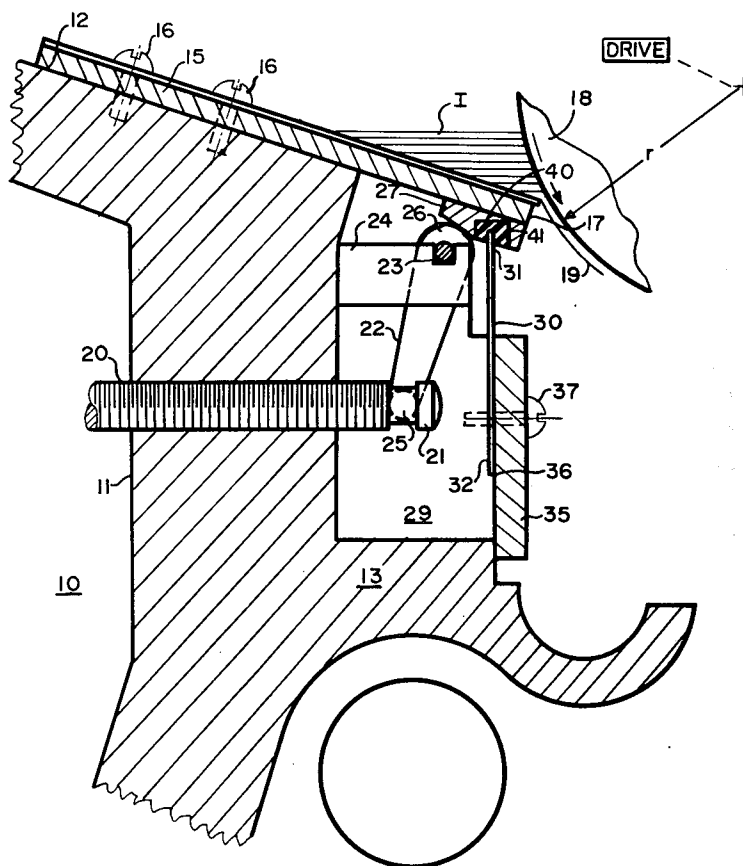
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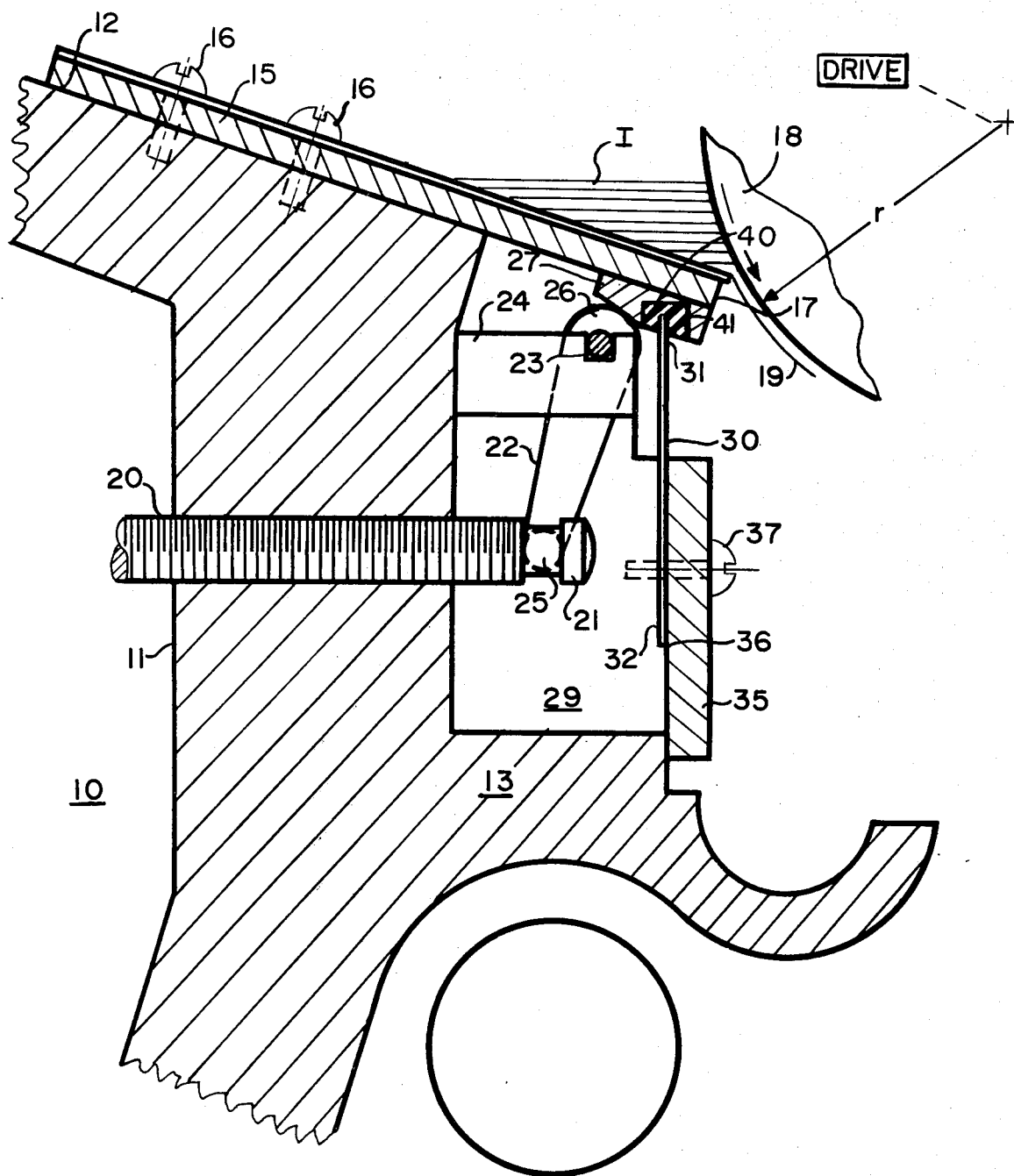
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[57] **ABSTRACT**

An ink fountain having a frame and fountain roller, the frame having a generally vertical wall portion to which the blade is secured in overhanging relation defining a longitudinally extending chamber under the blade. Adjusting mechanism for the blade is mounted in the chamber for engagement with the underside of the blade to control the thickness of ink film. A closure plate is provided on the frame for totally enclosing the chamber to prevent entry of paper dust and ink either in liquid form or in the form of airborne mist, the closure plate having a yieldable sealing connection with the blade in the form of a strip of elastomeric material which is sufficiently elastic so as to yieldingly accommodate adjusting movement of the blade.

1 Claim, 1 Drawing Figure





INK FOUNTAIN IN PRINTING PRESSES

The usual type of ink fountain employs a fountain blade having a plurality of adjusting screws arranged at closely spaced intervals along its length for localized adjustment of the gap between the tip of the blade and the fountain roller, thereby to adjust the thickness of the film of ink deposited on the fountain roller. The adjustment calls for a high degree of precision and reproducibility, with a portion of the blade closely "following" movement of each screw in both directions without any lag or stickiness.

It is the object of the present invention to provide an ink fountain which offers the necessary precision of adjustment not only when the fountain is initially installed but which retains the same precision after many years of hard usage. It is a more specific object of the invention to provide an ink fountain which is accurately and sensitively adjustable over long periods of time in spite of the contaminants in the form of paper dust in combination with dried or gummy ink which degrades the adjustability of conventional designs of fountains. Indeed, it is an object to provide a fountain adjusting mechanism which is capable of operating over long periods of time unaffected even by the airborne ink mist usually present in an operating press room.

Other objects and advantages of the invention will become apparent upon reading the attached detailed description and upon reference to the drawing which shows a vertical cross section taken through an ink fountain of my improved design.

The general type of ink fountain to which the present invention is applicable includes a longitudinally extending frame having end members which journal the fountain roller together with means for driving the fountain roller at a low rate of speed. Since journaling in end members and driving are conventional and do not form a part of the present invention, such structure has, for simplicity, been omitted from the drawing.

The frame 10 of the ink fountain includes a vertically extending wall portion 11 having, along its upper edge, a flat supporting surface 12. At the foot of the wall 11 is a generally horizontally extending base portion 13.

Mounted upon the supporting surface 12 is a fountain blade 15 which is held in place by screws or the like 16 and which has a longitudinally extending tip portion 17. The tip of the blade is spaced closely adjacent the surface of the fountain roller 18. Pocketed between the blade and the roller is a body of ink I, with the result that, as the roller turns, a film of ink 19 is formed on its surface. As will be understood by one skilled in the art, such film is transferred to a series of ink rollers and drums (not shown), a portion of which are usually vibrated endwise, so that a thin and consistent film of ink reaches the form roller for transfer to the printing plate.

In carrying out the invention the base portion of the frame is laterally projecting and the blade is mounted overhangingly so that the blade and base portion define between them a longitudinally extending chamber. The means for adjusting the blade spacing is mounted within this chamber, and the chamber is enclosed by a longitudinal closure plate, the lower edge of which is sealed to the frame and the upper edge of which is sealed by a strip of resilient material to the underside of the blade so that the chamber is tightly shielded against the entry of foreign material, either liquid or airborne, in all positions of adjustment of the blade.

Turning attention to the adjusting means, an adjusting screw 20 is provided which penetrates the wall portion 11 of the frame with a snug fit, the tip 21 of the screw being located within the chamber with freedom for endwise movement. Coupled to the tip of the screw is an adjusting member in the form of a crank 22 which is rockably swingable about a horizontal pin 23 supported in a bracket 24, the lower end 25 of the pin being captive in the tip of the screw. The upper portion 10 of the crank 22 is formed into a cam surface 26 which is engaged by a cam follower member 27 which is secured to the underside of the tip portion of the blade. It will be apparent that the profile of the cam 26 may vary over wide limits, the only requirement being that the cam surface be eccentric with respect to the pin axis to a degree and direction sufficient to provide the desired amount of "throw" of the blade within the range of movement of the adjusting screw.

In accordance with the invention the chamber defined by the overhanging blade and projecting base, and which is indicated by numeral 29, is enclosed by a closure plate 30 having an upper edge 31 and lower edge 32, it being understood that the closure plate is sufficiently long so as to extend into sealed engagement with the non-illustrated end members of the fountain frame. For securing and sealing the lower edge of the closure plate to the base 13, a longitudinal mounting bar 35 is provided which is preferably coextensive with the closure plate and which abuts against mounting pads 36, to which the bar and closure plate are secured by appropriate screws 37. Thus by means of the bar 35 the lower edge of the plate 30 is sealed tightly and continuously to the base 13.

It is one of the features of the invention that a resilient sealing strip is interposed between the upper edge of the closure plate and the tip of the blade so as to maintain an impervious seal between the closure plate and the blade throughout the range of movement of the blade. More specifically, there is interposed between the blade a resilient strip of elastomeric material, such as rubber, which may be vulcanized to the closure plate and which has sufficient resiliency to yieldingly accommodate movement of the blade, without breaking the seal, even though the closure plate is stationarily anchored along its lower edge. In the present embodiment the strip of elastomeric material, indicated at 40, is mounted in a relatively wide longitudinal groove 41 formed in the underside of the cam follower member 27 which, in turn, is securely fixed to the underside of the blade. The upper edge of the closure plate extends centrally into the inverted U-shaped cross section of the strip and is thus tightly sealed on both sides. The strip is of relatively thick section between the mounting surfaces and is of flexible, relatively soft material. Moreover, the amount of blade movement is sufficiently limited and the mechanical advantage of the adjusting mechanism is sufficiently great so that the restoring force of the rubber strip is readily overcome, either in tension or compression, and does not affect the free adjusting movement of the blade. Indeed, the reactive stress of the strip may simply, as a minor factor, be added to, or subtracted from, the reactive force of the blade, depending upon whether the strip is, at a given point of adjustment, in tension or compression.

By use of the invention the longitudinally extending chamber 29, which may be broken up into sections by mounting pads 26, or which may be continuous is, nevertheless, tightly and continuously sealed against the

entry of contaminants, primarily ink and paper dust and particularly a combination of the two. The integrity of the seal is such that even airborne ink mist is prevented from entering and building up on the surfaces so that there is no possibility of the mechanism being degraded in its accuracy and responsiveness as a result of passage of time. Specifically, there is no possibility that dried ink may accumulate and interpose itself between the cam surface 26 and follower 27; on the contrary, accurate and consistent "metal-to-metal" contact is maintained in this critical region for the life of the fountain. Moreover, by keeping the thread of the screw 20 completely isolated against deposits of gummy ink, the screw remains free turning which is particularly desirable where the screw is rotated by a remotely controlled servo type drive motor of limited torque capability.

While the invention has been described in connection with a single screw and blade adjusting mechanism, one skilled in the art will appreciate that such mechanisms are provided in multiple, as an evenly spaced series, along the length of the blade for zonal or column-by-column, control of ink flow. Accordingly, the blade 15 may be of slit construction with sections, for example corresponding to column positions, arranged so closely side by side as to preclude any ink leakage. As a practical matter, the blade 15 may, as shown, be of composite construction in which the heavy base portion of the blade is slit on a zonal basis while the thin top portion is in tact from end to end. It will be understood that in the case of a slit blade the cam follower elements 27 will have an axial length equal to the width of the controlled section of blade, but the resilient strip 41 may, nonetheless, extend continuously over the length of the fountain with unbroken sealing integrity.

While the invention may take a number of forms within the scope of the appended claims, it is preferred to have the strip 40 of elastomeric material, i.e. rubber, continuously bonded to the upper edge of the closure plate and continuously bonded to the underside of the blade in the region of its tip so that adjusting movement of the blade is accommodated by elastic deformation. This type of joint is preferred over a slidable joint since deformation of the rubber is immune to collections of gummy or dried ink which may build up on the exposed side whereas a joint providing relative sliding movement may be subject to stickiness. Nevertheless, the invention in certain of its aspects is not limited to actual bonding or vulcanization provided that an elastomeric strip is used. For example, the closure plate 30, if unbonded to the strip 40, and hence slidable with respect to it, should develop any stickiness, relative movement would, thereafter, be accommodated by deformation of

the strip so that the effect would be the same regardless of whether there is intentional bonding.

It will be apparent to one skilled in the art that the advantages of the invention may be achieved economically both in the case of new and existing designs of ink fountains.

I claim:

1. In an ink fountain, the combination comprising a frame, a fountain roller mounted in the frame and extending parallel to it, the frame including a vertically extending wall portion providing an upwardly facing supporting surface as well as a base portion, a fountain blade secured to the supporting surface and having a projecting portion terminating in a tip extending into operative engagement with the under surface of the roller to define an ink film thereon said blade having on its bottom side a cam follower portion spaced inwardly of said tip, the base portion projecting laterally from the wall in the same direction as the blade, the projecting portion of the blade and base portion of the frame vertically opposed thereto being of approximately equal dimension and together defining a longitudinal chamber under the blade, a body of ink above the blade, means for rotating the roller so that its surface rotates downwardly through the body of ink, adjusting mechanism in the chamber engaging the underside of the blade and including a series of adjusting screws which penetrate the wall portion and which are sealed with respect to it, the screws having individual cams engaging the blade along said cam follower portion so that as the screws are operated the tip of the blade undergoes localized adjusting movement toward and away from the surface of the fountain roller, a closure plate which extends generally vertically so as to make an obtuse angle with the blade as well as extending longitudinally of the frame to enclose the chamber, said closure plate having an upper edge extending to within a short distance of the underside of the blade adjacent said tip and having a lower edge which is stationarily secured to the laterally extending base portion of the frame for making a leakage tight joint with the latter, and a resilient strip extending continuously along the upper edge of the closure plate to seal the joint between the closure plate and the underside of the fountain blade so that the chamber is substantially sealed against paper dust and ink either in liquid form or in the form of airborne ink mist, the strip being formed of elastomeric material continuously joined to the upper edge of the closure plate and continuously joined to the underside of the blade at the tip thereof so as to enclose within the chamber, the screws, cams, and cam follower region, the strip being sufficiently resilient so that localized adjusting movements of the blade are accommodated by elastic deformation of the resilient strip while preserving the integrity of the seal.

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