

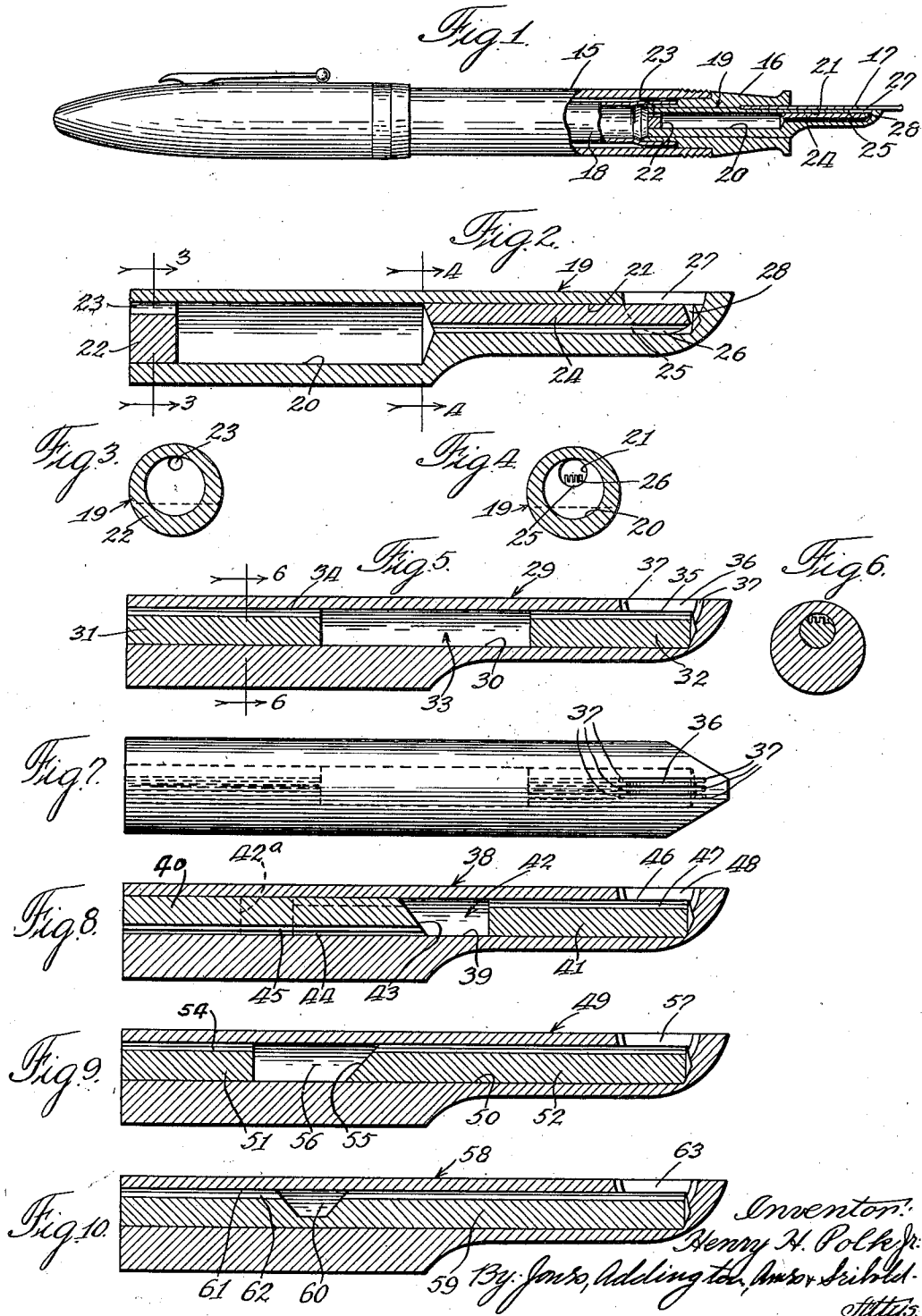
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FOUNTAIN PEN

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FOUNTAIN PEN

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This invention relates to a fountain pen and has special reference to the feed bar of a fountain pen located between the reservoir or barrel and the pen nib thereof to insure the proper flow of writing fluid and at the same time to prevent the writing fluid from flooding or feeding so freely as to cause blots, smears, and the like, on the writing surface.

More particularly, this invention relates to a feed bar for conducting writing fluid to the pen nib of a fountain pen comprising an elongated housing having a bore extending over a major portion of the length thereof communicating with a slot adjacent the underneath surface of the pen nib, there being insert means fitting within the bore having longitudinally extending channels communicating with the slot and a reservoir intermediate the limits of said insert means and confined by the walls of the bore for intersecting said channels.

While in fountain pens heretofore in use, the feed bars have been so constructed and arranged as to permit a desired flow during normal use in writing, there are occasions when a slight expansion of air or a jar or some such occurrence will cause an abnormal flow in a device which is otherwise perfect in operation. Difficulty has always been experienced particularly in the sackless type of fountain pen when the reservoir is partly empty, since the heat of the hand in writing, or of the body in carrying, expands the air. The present invention contemplates the provision of a substantial quantity of ink adjacent the pen nib available for immediate flow to the writing surface, the flow thereof to the nib being regulated by the presence of an air bubble held constantly in the reservoir intermediate the extremities of the insert means of the feed bar.

The present invention teaches that by holding a bubble of air in the reservoir, the reservoir intersecting the channels or all of the fissures in which the ink passes by capillary attraction to the pen nib, the feed bar is prevented from flooding although a constant flow is permitted and a substantial supply is always available for immediate use. While the air bubble in the reservoir acts as a check valve to regulate the flow of ink, applicant further contemplates the provision of fissures in the slot of the housing in alignment with the fissures of the insert means so that the flow from the reservoir to the underneath side of the pen nib is afforded continuous capillary attraction.

It is one of the objects of this invention to

provide a fountain pen having a feed bar of the type indicated above in which under all conditions of use the flow of ink is desirably regulated and a supply of ink is always immediately available to the pen nib in writing.

Other objects and advantages will hereinafter be more particularly pointed out, and for a more complete understanding of the characteristic features of this invention, reference may now be had to the following description when taken together with the accompanying drawing, in which latter:

Figure 1 is a side elevational view partially in section of a fountain pen construction embodying one form of this invention;

Fig. 2 is a central longitudinal sectional view of the feed bar employed in Fig. 1;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 2;

Fig. 5 is a central longitudinal sectional view of a modified form of feed bar embodying the present invention;

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 5;

Fig. 7 is a plan view in elevation of Fig. 5;

Fig. 8 is a central longitudinal sectional view of a further embodiment of this invention;

Fig. 9 is a view similar to Fig. 8 of still another form embodying this invention; and

Fig. 10 is also a view similar to Fig. 8 showing another modified form of this invention.

Referring now to the drawing and more particularly to Figs. 1 to 4, inclusive thereof, the device of this invention is illustrated as comprising a barrel 15 having an open end for receiving a feed section 16, the latter supporting at one end thereof a pen nib 17 and at the other end thereof a sack 18 for writing fluid. The barrel 15 and feed section 16 may preferably be formed of a composition material, rubber or the like, as is usual in present day fountain pen construction.

The feed section 16 is provided with a bore for receiving in a forced fit relation therein a feed bar housing 19. The feed bar housing is preferably formed of rubber and has a cylindrical portion at the rear end thereof for sealed engagement within the bore of the feed section, a portion of the feed bar housing 19 extending forwardly beyond the end of the feed section 16 in the usual manner and being of a somewhat semi-circular cross section. In the present embodiment, the feed bar housing 19 is provided

with a bore extending over a major portion of the length thereof, the bore being relatively greater in diameter at the rear end portion 20 and of relatively smaller diameter at the forward portion 21. A plug 22 encloses the rear end of the bore 20, the plug having a small aperture 23 therethrough in communication with the bore 20. The bore 21 of reduced diameter is provided with an insert 24, the insert fitting snugly within the bore and extending preferably the full length thereof.

The insert 24 is provided with a channel 25 extending longitudinally over a portion of the peripheral surface thereof, the channel preferably having fissures 26 broached in the base thereof and extending in the same direction. The channel and fissures communicate with an elongated slot 27 in the feed bar housing through a duct 28, the channel and fissures being preferably disposed along the peripheral surface diametrically opposed to that surface lying adjacent the slot 27. The slot 27 is, of course, disposed adjacent the pen nib 17, the pen nib lying against that portion of the surface of the feed bar housing and being held in position by the housing in its relation with the bore of the feed section 16.

In the operation of the construction thus far disclosed, writing fluid from the sack 18, or from any reservoir, passes through the aperture 23 into the enlarged bore 20 and is thence conducted by capillary attraction through the fissures 26 to the duct 28 to be directed through the slot 27 to the underneath side of the pen nib. While the present embodiment illustrates a sack type pen, still it is to be understood that this construction is very well adapted and perhaps more particularly adapted to the type of fountain pen employing no sack, since the condition which the present construction contemplates preventing seems more apparent in the sackless type pen than in the sack type pen.

Referring now more particularly to Fig. 5, a feed bar housing 29 is shown having a cylindrical rear end portion for fitting within the bore of the feed section and a reduced forward end portion of substantially semi-circular cross section which extends beyond the end of the feed section. The feed bar housing is provided with a bore 30 which is preferably of substantially uniform diameter throughout the length thereof, the bore extending over a major portion of the length and being open-ended at one end, the other end being closed. In this embodiment, a pair of spaced inserts 31 and 32 are provided, the insert 31 extending inwardly from the extreme rear end and having one end flush with the end of the feed bar housing, the other insert 32 being at the forward end of the feed bar housing and having one end thereof preferably engaging the end of the bore. The space between the inner ends of the inserts provides a reservoir 33 for trapping an air bubble to regulate the flow of writing fluid in a manner which will hereinafter be more particularly pointed out. Each of the inserts 31 and 32 is provided with channels having longitudinally extending fissures 34 and 35, respectively, the fissures being disposed adjacent what might be called the top of the housing or that portion of the housing which the pen nib overlies.

The forward end of the feed bar housing 29 is provided with an elongated slot 36 adjacent the fissures 35 of the insert 32, the width of the slot being preferably the width of the channel or the combined width of the fissures 35.

In order to afford continuous capillary attraction of the ink from the fissures 35 to the bottom of the pen nib, the ends of the slot are provided with fissures 37 which register with the fissures 35 of the insert, and, in effect, form a continuation thereof. However, the fissures are preferably inclined so as to direct the writing fluid forwardly from the insert to the pen nib, the angularity of the fissures being accomplished by means, for example, of a cylindrical broaching tool. The fissures from the insert to the underneath surface of the pen nib are unbroken and may afford a continuous capillary attraction to the writing fluid.

Referring now more particularly to Fig. 8, the feed bar housing 38 is of substantially the same form as that previously described in Fig. 5, the housing 38 having a bore 39 of substantially uniform cross section extending over a major portion of the length of the housing, one of the ends of the bore being open and the other closed. Spaced inserts 40 and 41 are provided, the space between the inserts affording a reservoir 42. In this instance, the insert 40 is provided with a tapered end 43 or an end which is cut obliquely with reference to the axis of the bore. Further, the insert 40 is provided with a longitudinally extending channel 44 having fissures 45 broached therein and extending in the same direction therewith, the channel and fissures being disposed on the peripheral surface of the insert at a portion opposed to that portion of the peripheral surface lying beneath the pen nib. The insert 41 is likewise provided with a channel 46 extending longitudinally thereof, the channel having fissures 47 broached therein and extending in the same direction as the channel. The channel and fissures in the insert 41 are on that portion of the peripheral surface of the insert directly beneath the pen nib.

In the operation of this form of construction, the writing fluid passes from the barrel along the fissures 45 to the reservoir 42 where the further supply thereof to the pen nib is regulated by an air bubble therein. The writing fluid is directed from the reservoir 42 along the fissures 47 by capillary attraction to the slot 48 which is elongated and provided with fissures at the ends thereof as described in the construction of Fig. 5. The fissures in the ends of the slot 48 afford a capillary attraction which is continuous from the fissures 47 to the underneath side of the pen nib with which the housing is in contact.

The location of the reservoir 42 as well as the size thereof are controlled by the capacity or the amount of writing fluid that the barrel of the fountain pen holds. In other words, a feed of fixed dimensions will not function in all pens and it is therefore the purpose of this application to direct that they be of more or less proportional sizes to the constructions shown herein. For example, the capacity of the reservoir 42 in Fig. 8 is shown as being smaller than the capacity of that in Fig. 5. The location of the reservoir in both instances is substantially midway of the housing, while it may be desirable in some instances to move the chamber 42 in Fig. 8 back to the dotted line position indicated by the numeral 42^a.

The embodiment illustrated in Fig. 9 is more or less similar to the embodiment shown in Fig. 5, the feed bar housing 49 having a bore 50 extending over a major portion of the length of the housing and being of substantially uniform cross section, the rear end being open and the

forward end being closed. The bore is provided with a pair of spaced inserts 51 and 52, the insert 51 being substantially smaller in length than that of the insert 52 and having a longitudinally extending channel 53 with fissures broached therein in the same direction. The insert 52 is likewise provided with a channel on the peripheral surface thereof and in a common plane with the fissures and channel of the insert 51. However, the end of the insert 52 is cut obliquely as at 55 which, in some instances of use, may be desired. The writing fluid passes from the sack or barrel through the fissures 54 into the reservoir 56 provided in a space between the inserts 51 and 52, there being a bubble contained therein for regulating the flow of the writing fluid through the fissures of the insert 52 to the slot 57 and thence to the underneath surface of the pen nib.

Referring now more particularly to Fig. 10, a feed bar housing 58 shown therein is similar in all respects to those in Figs. 5 to 9, inclusive, the housing having a bore of substantially uniform diameter extending a major portion of the length thereof to receive an insert 59 which is provided with a well 60, the well being cut in the feed bar substantially below the depth of the channel 61 and the fissures 62 extending longitudinally over a peripheral surface thereof. This form preferably shows the reservoir as being of substantially V-shape and of such a size as to permit a constant air bubble to remain therein to regulate the flow of writing fluid along the fissures 62 from the barrel of the pen to the notch 63 located beneath the pen nib.

The constructions above recited provide an even flow of writing fluid and prevent flooding or blotting by their unique action in controlling or regulating the flow of ink by means of a constant air bubble held in a reservoir intermediate the extremities of insert means.

While several embodiments of this invention are shown herein, it is, of course, to be understood that various modifications thereof will be apparent to those skilled in the art without departing from the spirit and scope of this invention and therefore the same is to be limited only by the prior art and the scope of the appended claims.

I claim:

1. A feed bar for conducting writing fluid to

the pen nib of a fountain pen comprising an elongated housing having intercommunicating enlarged and reduced bores extending over a major portion of the length thereof, the reduced bore communicating with a slot adjacent the underneath surface of the pen nib, and spaced cylindrical inserts fitting within said bores to provide a reservoir therebetween, one of said inserts having a plurality of longitudinally extending fissures at the peripheral surface thereof opposite to and communicating with said slot.

2. A feed bar for conducting writing fluid to the pen nib of a fountain pen comprising an elongated housing having a bore of cylindrical cross section extending over a major portion of the length thereof communicating with a slot adjacent the underneath surface of the pen nib, and spaced cylindrical inserts fitting within said bore to provide a reservoir therebetween, said inserts having a plurality of longitudinally extending fissures at the peripheral surfaces thereof, the fissures of one of said inserts being so disposed as to communicate with said slot and the fissures on the other of said inserts being disposed in a diametrically opposed relation thereto.

3. A feed bar for conducting writing fluid to the pen nib of a fountain pen comprising an elongated housing having a bore extending over a major portion of the length thereof communicating with a slot adjacent the underneath surface of the pen nib, insert means fitting within said bore having a plurality of longitudinally extending fissures communicating with fissures in the ends of said slot, and a reservoir intermediate the limits of said insert means and confined by the walls of said bore and said insert means for intersecting all of said fissures, said reservoir being of greater depth than said fissures.

4. A feed bar for conducting writing fluid to the pen nib of a fountain pen comprising an elongated housing having a bore extending over a major portion of the length thereof communicating with a slot adjacent the underneath surface of the pen nib, and an insert fitting within said bore having a plurality of longitudinally extending fissures, the ends of said slot having fissures cut therein tapering to the outer surface of the housing in registration with said fissures of the insert.

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