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FOUNTAIN PEN

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It is among the objects of the invention to provide a fountain pen and more especially a writing end construction thereof, which shall be outstandingly simple and inexpensive and which shall considerably alleviate, if not entirely overcome, the difficulties encountered with many otherwise well made and high priced fountain pens and which in particular shall not only start instantly as long as there is any ink in the reservoir, but which shall be substantially proof against overflow or excessive discharge or blotting even when the ink is low in the reservoir.

In the accompanying drawing in which is shown one of various possible embodiments of the several features of the invention,

Fig. 1 is a view of the pen in longitudinal cross-section,

Fig. 2 is a sectional view of the forward portion thereof taken on line 2—2 of Fig. 1,

Figs. 3, 4 and 5 are transverse sectional views on a somewhat larger scale taken respectively on the lines 3—3, 4—4 and 5—5 of Fig. 1, and

Fig. 6 is a perspective view of the feed rod.

Referring now to the drawing, the pen barrel and filling equipment may be of any desired construction either of the bag filler, plunger, vacuum or other type. Illustratively a more or less conventional plunger type of pen is shown in which the barrel 10 is equipped with piston 11 having a plunger 12 protruding through the end wall 13 of the barrel and a removable cap 14 protecting the said plunger during normal use. Where the plunger type filler is used, it is preferably of improved type shown but not claimed herein. It comprises preferably a felt piston 15 over the reduced end 18 of the plunger rod 12, which is upset at its extremity at 17 over a washer 16, said plunger rod being releasably threaded at 19 into the correspondingly tapped bore in the barrel end wall 13, so that upon rotating the piston rod after filling the pen, the felt plunger is placed under compression and the entry of air and possible leakage, are avoided. This construction need not be described in further detail as it constitutes the subject-matter of my co-pending application, Serial No. 442,887 filed May 14, 1942.

The section of the pen is preferably a conical tip 20, the shank 21 of which may be frictionally fitted into the forward end of the barrel. The tip has a longitudinal axial bore 22 through the entire length thereof.

The feed is a simple solid rod 25 with parallel flats 26, the intervening curved areas 24 thereof

snugly fitting into the bore 22 of the fountain pen tip and desirably extending the entire length of the bore as shown. The forward end of the feed rod is bifurcated to afford a pair of thin rather flexible fingers 27 and 28 spaced by the width of the rather wide slot 29 therebetween. Desirably the slot is of width approximately equal to the thickness of each of the fingers 27 and 28. One of the fingers 27 is desirably of considerable length, in a preferred embodiment approximately $\frac{3}{8}$ inch long and is rounded as at 30 at its forward end. The other finger 28 is considerably shorter, its length being desirably only in the order of $\frac{1}{4}$ inch, and it may terminate abruptly in a square end 31.

The end of the shorter finger 28 of the feed rod is well within or above the forward rim of the tip and may be in the order of $\frac{3}{8}$ inch above said tip. The longer finger 27 protrudes somewhat beyond the forward end of the tip. In a practical construction, such protrusion may be for a length in the order of $\frac{1}{8}$ inch as at 32. Both fingers are convex at their outer face and are snugly engaged by the bore 22 of the tip.

The fountain pen nib is of extraordinarily small dimensions. Its length may be in the order of as little as one-half inch and its width in the order of one-eighth inch, so that it requires but a small fraction of the metal of the conventional pen. Thus the invention makes possible the use of gold for the nib of a pen in a surprisingly low price range. In shape the pen point may otherwise be identical with that of the usual pen point, including as it does the generally cylindrical shank portion 33, and the nib portion 34 with the iridium point 35 and longitudinally slit at 36. The length of the pen nib axially engages the inner flat face 37 of the feed finger 27 as best shown in Fig. 5 and the lateral edges of the shank of said pen nib frictionally engage the tip along diametrically opposite parts of the wall of the cylindrical bore 22. The pen nib extends inward from the forward end of the tip to near, preferably slightly beyond, the forward end 31 of the shorter feed finger 28.

The pen nib is securely held in position, since it can neither rock nor move parallel to itself, by reason of the fact that its center line and its lateral edges form a three-point support, two points of which are along opposite edges of a diametral plane of the bore. The flexible long finger 27 is adequately protected against breakage since it is clamped between the pen nib and the tip and its short protruding forward end 32 is not subject to injury.

In operation, it will readily be seen that the ink travels down through the segmental passageway 40 between a flat of the feed and the bore, while venting takes place through the other segmental passageway 41 and the ink readily reaches the pen nib as the pen is being used. When the pen barrel is nearly empty, so that the major barrel contents are air, overflow or leakage of ink due to expansion of the air in the pen barrel under rising temperature is substantially obviated by the present invention, even while the pen is not being used. For, the ink propelled along the feed rod due to such air expansion, enters the cavity 42 between the two fingers of the feed rod, tending to fill that cavity. Under unusually great rise in temperature such cavity 42 might become completely filled. Leakage would not occur, however, even were such high temperature sustained for a long time, for under such condition ink would overflow into cavity 43 below the edge 31 of the shorter feed finger 28 and between the concave side of the pen point 33 and the bore 22. The said cavities 42 and 43 constitute a well which would have to be completely filled with ink before blotting or overflow could occur as a result of further air expansion. That is quite unlikely even under extremely unfavorable conditions of operation. The ink, even though it nearly fills both the cavities 42 and 43 will be effectively retained therein by capillary action without any likelihood of overflow.

While the pen is in actual use the air in the barrel expanding under the heat of the hand would advance the ink at rate no faster than the rate of ink consumption in writing, so that cavities 42 and 43 would not tend to collect ink during writing, even under unfavorable conditions.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope of the claims, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A fountain pen comprising a conical tip having an axial bore therein, a feed rod laterally flattened and fitting in said bore, said feed rod being bifurcated and affording a pair of spaced forwardly extending fingers, one of said fingers terminating short of the forward end of the tip, the other protruding beyond said tip and a pen nib frictionally gripped at its lateral edges by the wall of said bore, the mid-section of said pen nib extending longitudinally of and engaging the forward part of said protruding finger and clearing the other finger.

2. In a fountain pen, a conical tip having a longitudinal bore, a flattened solid feed rod snugly engaging said bore along the surfaces

between the flats and protruding inward beyond said bore, said feed rod being longitudinally slotted at its forward end, to afford a pair of fingers, one of said fingers being considerably longer than the other, both of said fingers engaging the bore of the tip, the longer finger protruding beyond the forward end of the tip, the shorter finger being wholly within said tip and a pen nib snugly engaging the inner face of said longer feed finger, the lateral edges of said pen nib being frictionally engaged along diametrically opposite parts of the bore in the tip.

3. A fountain pen comprising a conical tip having an axial bore, a solid feed rod frictionally fitting in said bore and affording a feed passage, said rod having a thin forwardly extending finger engaging the wall of said bore, the longitudinal edges of said pen nib engaging diametrically opposite parts of the wall of said bore, with said feed finger retained between the pen nib and the wall of the bore, said feed rod affording a substantial open ink retaining well within the tip communicating with said feed passage and located between the pen nib and the wall of the bore.

4. In a fountain pen, the combination of a conical tip having a longitudinal bore, a solid feed rod flattened along opposite sides and snugly fitting in said bore, said rod being longitudinally bifurcated at its forward end to afford a pair of substantially spaced thin fingers, one of said fingers protruding from the forward end of the tip, a pen nib longitudinally engaging the inner face of said protruding finger, and the lateral edges of said nib frictionally engaging diametrically opposite parts of the wall of said bore, the other finger of said feed bar being within said tip adjacent the inner end of said pen nib.

5. In a fountain pen, the combination of a conical tip having a cylindrical bore, a unitary feed rod comprising a pair of parallel flats snugly fitting at the region between said flats in said cylindrical bore, the forward end of said feed rod being bifurcated to afford a pair of thin fingers spaced from each other by a substantial gap, the roots of said fingers being encompassed by said cylindrical bore, one of said fingers extending along said bore somewhat beyond said tip, the other of said fingers extending along and wholly within said bore for a length less than half the length of the longer finger, and a curved pen nib symmetrically engaging the inner flat face of the longer finger, the lateral edges of said pen nib frictionally engaging diametrically opposite parts of the wall of said bore and the inner end of the pen nib being near the forward end of the shorter finger.

6. The fountain pen recited in claim 5 in which the longer finger is rounded at its outer end and the shorter finger ends abruptly and in which each of the fingers is of thickness approximately one third the diameter of the feed rod.

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