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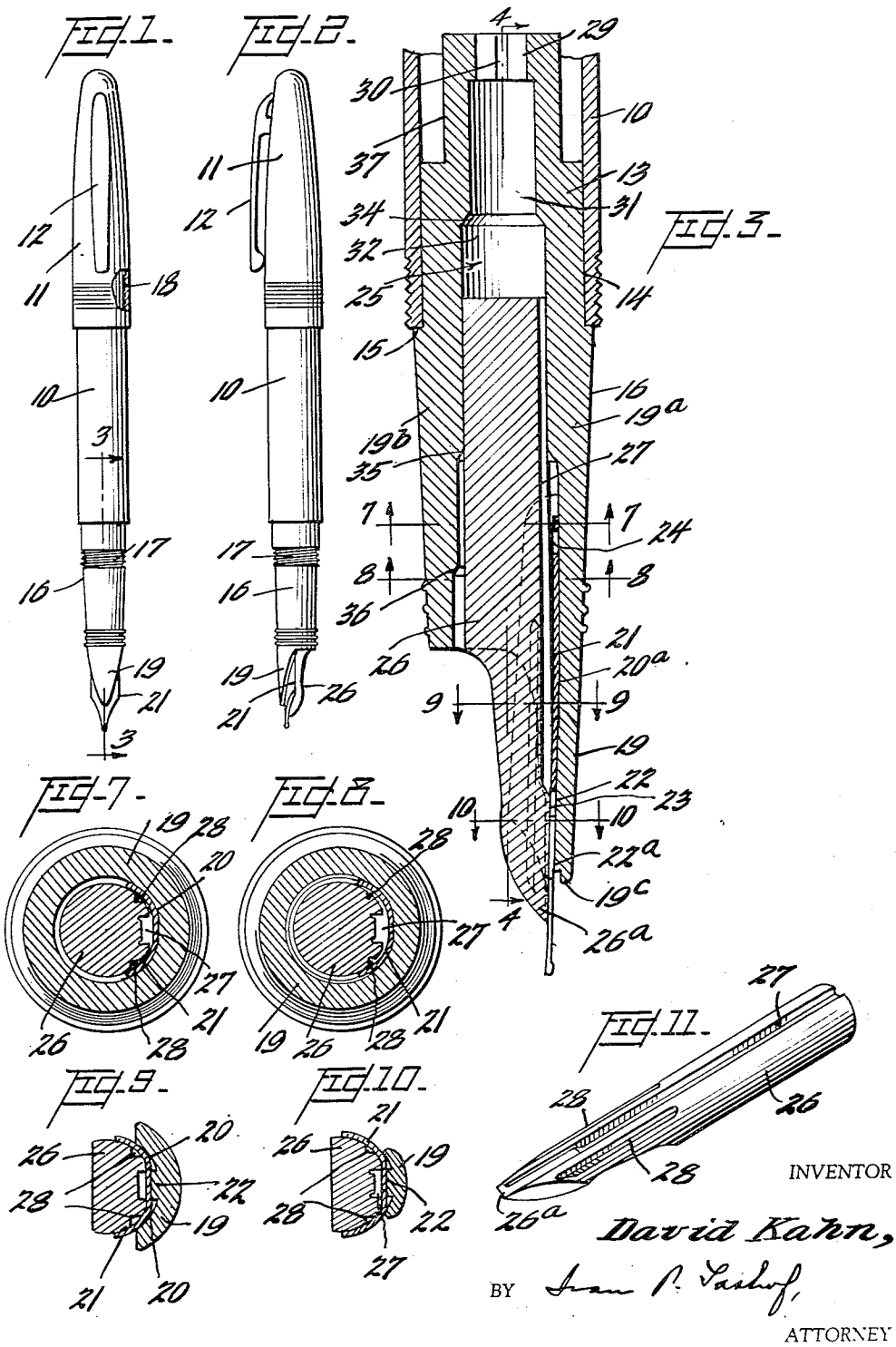
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FOUNTAIN PEN WITH IMPROVED FEED CONSTRUCTION

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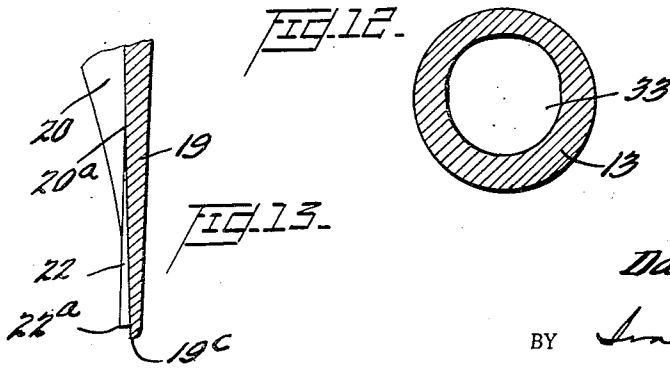
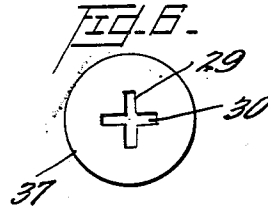
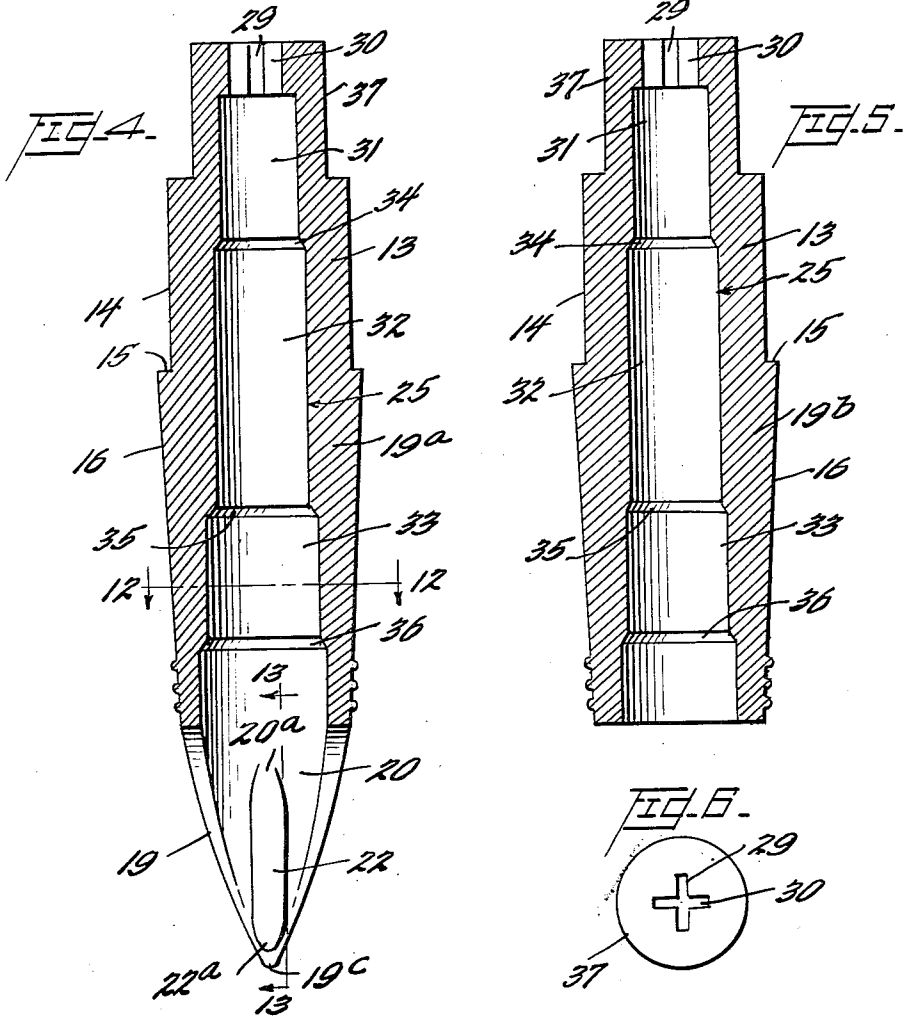
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2 Sheets-Sheet 2



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FOUNTAIN PEN WITH IMPROVED FEED CONSTRUCTION

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2 Claims. (Cl. 120—52)

This invention relates to fountain pens, and has special reference to feeding means for the ink of such a pen.

An important object of the invention is to provide a novel form and arrangement of nozzle and fountain pen feed for such a pen.

Another important object of the invention is to provide a novel form and arrangement of feed bar in a fountain pen, as well as a novel combination of nozzle and feed bar with the nib of a fountain pen.

Still another object of the invention is to provide a fountain pen nozzle which has an extension forming a hood shaped and constructed in a novel manner, there being a novel feeding arrangement for the fountain pen wherein the feed will be along the concave side of the pen, the hood being constructed and arranged so as to prevent leakage of the pen when not in use.

With the above and other objects in view as will be presently apparent, the invention consists in general of certain novel details of construction and combinations of parts hereinafter fully described, illustrated in the accompanying drawings and particularly claimed.

In the drawings, like characters of reference indicate like parts in the several views, and:

Fig. 1 is a view of the pen in elevation and from the hood side thereof;

Fig. 2 is a view similar to Fig. 1 but at right angles thereto;

Fig. 3 is an enlarged detail section on line 3—3 of Fig. 1;

Fig. 4 is a section of the nozzle on line 4—4 of Fig. 3 looking in the direction of the arrows;

Fig. 5 is a section of the nozzle on line 4—4 of Fig. 3 looking in the direction opposed to the arrows and towards the non-hood portion of the pen section;

Fig. 6 is an upper end view of the nozzle member;

Fig. 7 is a section on line 7—7 of Fig. 3;

Fig. 8 is a section on line 8—8 of Fig. 3;

Fig. 9 is a section on line 9—9 of Fig. 3;

Fig. 10 is a section on line 10—10 of Fig. 3;

Fig. 11 is a perspective view of the fountain pen feedbar;

Fig. 12 is a section on line 12—12 of Fig. 4; and

Fig. 13 is a section on line 13—13 of Fig. 4 looking in the direction of the arrows.

Fountain pens are usually held in more or less erect position when one is writing with such a pen. Accordingly, for making clear the relation of the parts to each other, the end of the pen carrying the nib is called the lower end, and the opposite end is designated the upper end.

The pen is provided with the usual barrel 10 and is also provided with a cap 11, preferably having a clip 12 attached thereto for convenience in carrying the pen in one's pocket. As shown, the cap is mounted on the upper end of the barrel, but obviously when the pen is not in use, the cap is mounted on the lower end of the barrel. In the lower end of the barrel is fitted the upper

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tubular end 13 of a nozzle member, a surface 14 being provided on the nozzle 13 for making the fit more secure and for preventing rotation of the nozzle in the barrel. At its lower part projecting from the barrel, the nozzle is provided with a shoulder 15 which rests against the lower end of the barrel. Extending from the shoulder the nozzle tapers in a downward direction as indicated at 16 so that it gradually decreases in diameter. On the lower end of the barrel 10, there is preferably formed screw threads 17 and the cap 12 preferably has internal threads 18 for engaging the screw threads 17. Extending from the lower end of the nozzle proper is an extension portion 19 herein termed a hood. On the inner side of the hood there is provided a longitudinally extending surface 20 arcuate in cross section for the purpose of partially surrounding the nib 21, this being of the usual and well-known shape. Extending along the groove formed by the surface 20 is a rib 22 which at its lower portion is gradually thickened as best seen in Fig. 3, to rest on the nib adjacent the point thereof. The upper end of the rib merges into the surface 20 at the point 20^a and from the point of merger to the lower end 22^a of the rib 22, the rib rests on the top surface of the nib 21 or, at the most, the space between the rib and nib should be a capillary space and not greater than between 0.002 inch and 0.003 inch.

The lower end of the hood and the lower end of the rib 22 should cover the usual nib air hole or aperture 23 of the nib 21. This will aid in preventing the ink in the feed grooves of the feedbar 26 from drying in said grooves. The thickened end 22^a of the rib 22 terminates adjacent the lower end 19^c of the hood.

As here shown, the nib is provided with a transverse notch 24 or the like, to insure a tight fitting of the nib in position. The bore of nozzle is indicated at 25 and in the lower end of this bore there is fitted a feedbar 26 having a capillary groove 27 extending longitudinally thereof and positioned, when the parts are assembled, confronting the rib 22, the nib 21 being interposed between the rib 22 and capillary groove 27. It is to be particularly noted that the groove 27 terminates in spaced relation to the lower end of the feedbar 26. The purpose of this is to prevent leakage of ink along the hollow part of the pen point. The bar 26 is also provided with a pair of narrow grooves or channels 28 located respectively on opposite sides of the groove 27. These narrow grooves have two purposes and are located well forward the lower end of the bar 26. One of the purposes is to provide a pair of pockets where into some of the ink flowing through the groove 27 may accumulate so as to keep the pen point well supplied with ink in liquid form and thus permit instant use in writing. The other purpose is to prevent escape of ink laterally from the edges of the nib. This is clearly shown in Fig. 9 where it will be seen that the grooves 28 are located well away from the lateral edges of the nib 21. The nib 21 is, of course, preferably of the usual shape and is flatter toward its upper end or base as best shown in Figs. 9 and 10.

The upper end of the nozzle may be reduced as at 37 for the purpose of attaching the usual rubber ink sac or the pen may be provided with any other of the well-known means of storing ink in such condition as to permit it to flow through the bore 25 and groove or channel 27 to the nib 21.

With the construction thus described, it will be seen that the pen will at all times be ready for writing so long as ink is held in the barrel to flow through the bore 25 and it will be further seen that the construction provides against any unwanted leakage of ink from the feed means for the nib.

It is to be noted that the top portion of the nozzle

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19 is provided with cross-slots 29 and 30, as shown in Fig. 6. During the molding of the nozzle 19 which may be made of any moldable material, these slots increase the flow of the plastic material.

The nozzle 19 is provided with an interior bore, which is indicated in general by the numeral 25. The bore is provided with lower sections 31, 32 and 33, said sections being spaced by shoulders 34 and 35 on the longer or hood portion 19a of the nozzle 19. As shown in Figs. 4 and 5, the nozzle end of the pen section 16 is provided with a shoulder 36. This shoulder defines a space around the feedbar to catch any overflow of ink. The hood, the rib on the hood, and the overflow space function together to prevent a complete drying of the ink around the pen so that the pen will start writing quickly even though the pen has lain sometime without the cap being in place.

In accordance with the present invention, there has been provided in a fountain pen of the underfeed type the combination of a nozzle adapted to fit in the lower end of the pen barrel, said nozzle having an open lower portion provided with a hood, a feedbar fitting into the lower nozzle portion and engaging the concave side of a pen nib, said feedbar having an ink feeding groove extending from its upper end along the pen and terminating in spaced relationship to the lower end of the feedbar, said nozzle hood having a groove confronting the feeding groove of the feedbar and a pen nib fitted in the nozzle groove, the concave face thereof bearing against the feedbar, said nozzle groove or hood groove having a rib extending centrally along its interior concave side and resting on said nib. This rib merges at its upper end into the concave surface of the grooves of the nozzle or hood and tapers in thickness from the merging end 20a downwardly. Preferably the rib 22 increases in thickness from the merging end downwardly, as shown in Fig. 3. This rib terminates closely adjacent the lower end of the nozzle, as shown in Fig. 4.

The rib 22 is tapered to insure proper fit with the nib 21 as the latter bends slightly in the middle to lay closely to the surface of the pen feed 26. In other words, the nib is curved very slightly from its inner to its outer end. The rib 22 extends longitudinally along the nib 21, which is also desirably provided with a slightly curved upper surface, this curve being too small to be discernible by the naked eye. The feedbar 26 is desirably, although not necessarily, curved downwardly towards its outer end 26a so as to follow the contour of the nib 21 when the two of them are placed in position in the barrel and the nib comes in contact with the rib 22. By this construction, there is no pressure on the center of the nib and consequently, therefore, no spreading of the points of the nib.

The rib 22 is at a slight angle to the longitudinal axis of the pen and merges into the inner surface of the nozzle 19 of the pen section 16 at a point approximately midway of the length of the nib 21 when the latter with the feedbar 26 is properly positioned in the pen section 16. This termination may be slightly below or slightly above the longitudinal center of the nib 21 when the feedbar 26 and the nib 21 are tightly positioned in the pen section, as shown in the drawing. As stated, it is to be noted that the pen nib has a contour which makes it higher at its longitudinal center than at either of its ends when the nib is laid on its back.

What is claimed is:

1. A writing instrument comprising a barrel, a nozzle having an upper tubular end seated in the lower end of said barrel, a shoulder arranged on said nozzle and abutting the lower end of said barrel, said nozzle being

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provided with a surface to prevent rotation of the nozzle in the barrel, said nozzle tapering downwardly so that it gradually decreases in diameter, a hood extending from the lower end of said nozzle and provided with a longitudinally extending arcuate groove for partially surrounding a nib having an aperture therein, a rib extending longitudinally along said groove and provided with a flat surface, the lower end of said hood and the lower end of said rib covering said aperture, said nozzle being provided with a longitudinally extending bore, a feed bar seated in the lower end of said bore and provided with a capillary groove extending longitudinally therethrough and arranged in confronting relation with respect to said rib, the flat surface of said rib and capillary groove being arranged on opposite sides of said nib, the upper end of said nozzle being reduced in diameter, said rib having its inner end merging into the nozzle, the lower end of said rib terminating adjacent the lower end of said nozzle, said capillary groove terminating in spaced relation from the end of said feed bar, the bore in said nozzle including a plurality of aligned sections of increasing diameter, and a shoulder arranged on said nozzle between adjacent sections and defining a space around said feed bar to catch any overflow of ink, said feed bar being provided with a pair of narrow channels arranged on opposite sides of said capillary groove, said channels and groove being arranged in spaced parallel relation with respect to each other, said capillary groove being spaced from the lateral edges of said feed bar, said channels terminating contiguous to the lower end of said feed bar, the top portion of said nozzle being provided with cross slots on the interior thereof, the bore of said nozzle including a plurality of sections separated by shoulders.

2. In a writing instrument, a barrel, a nozzle having an upper tubular end seated in the lower end of said barrel, a shoulder arranged on said nozzle and abutting the lower end of said barrel, said nozzle being provided with a surface to prevent rotation of the nozzle in the barrel, said nozzle tapering downwardly so that it gradually decreases in diameter, a hood extending from the lower end of said nozzle and provided with a longitudinally extending arcuate groove for partially surrounding a nib having an aperture therein, a rib extending longitudinally along said groove and provided with a flat surface, said nozzle being provided with a longitudinally extending bore, a feed bar seated in said bore and provided with a capillary groove extending longitudinally therethrough and arranged in confronting relation with respect to said rib, the flat surface of said rib and capillary groove being arranged on opposite sides of said nib, the upper end of said nozzle being reduced in diameter, said rib having its inner ends merging into the nozzle, the lower end of said rib terminating adjacent the lower end of said nozzle, said capillary groove terminating in spaced relation from the end of said feed bar, the bore in said nozzle including a plurality of aligned sections of increasing diameter, and a shoulder arranged on said nozzle between adjacent sections and defining a space around said feed bar to catch any overflow of ink.

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