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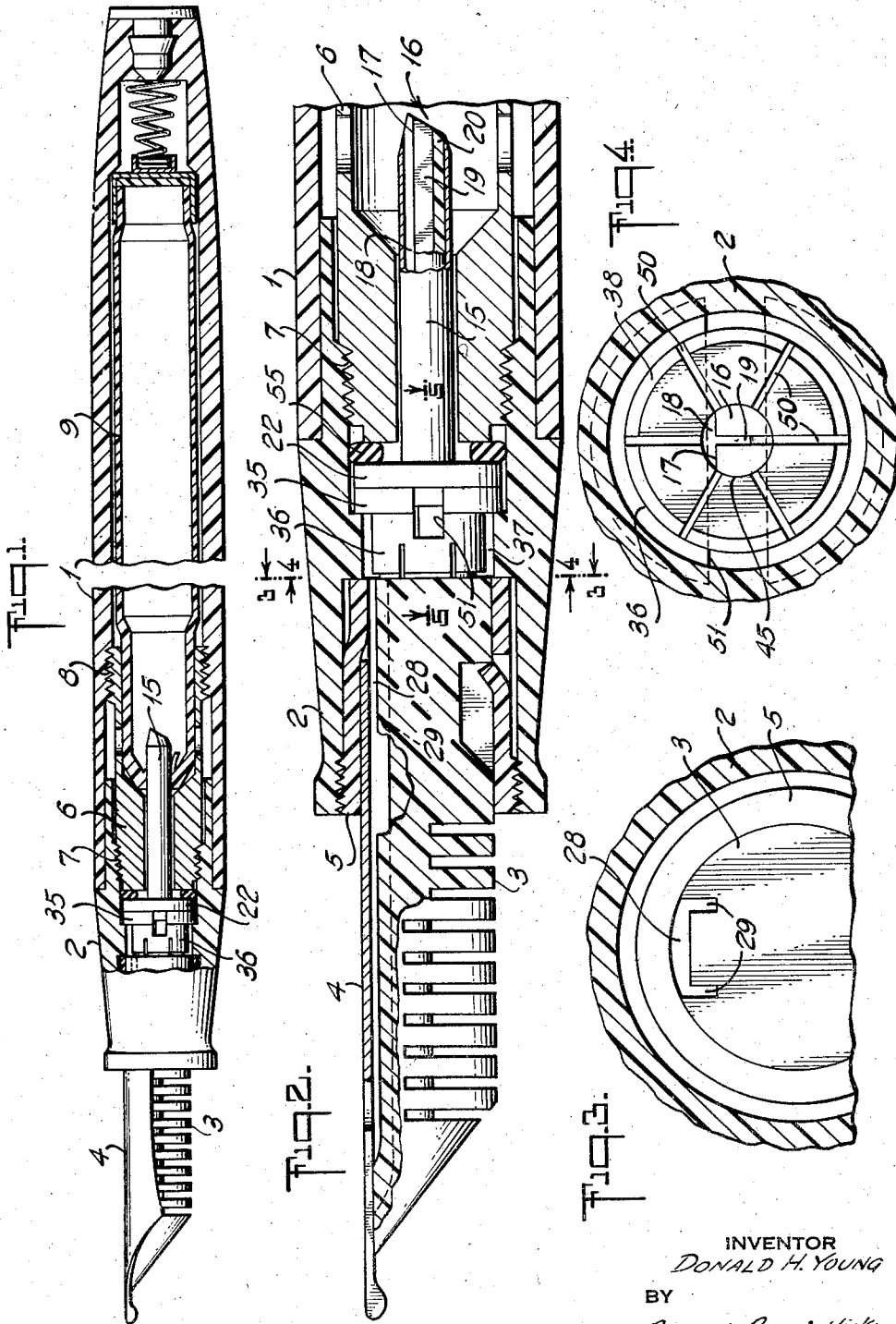
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FOUNTAIN PEN FEED CONSTRUCTION

Filed Oct. 24, 1955

2 Sheets-Sheet 1



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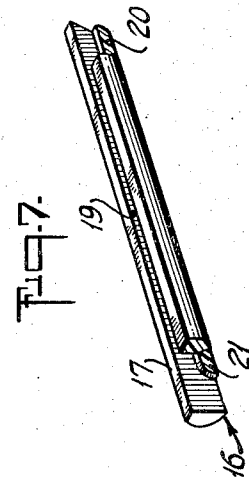
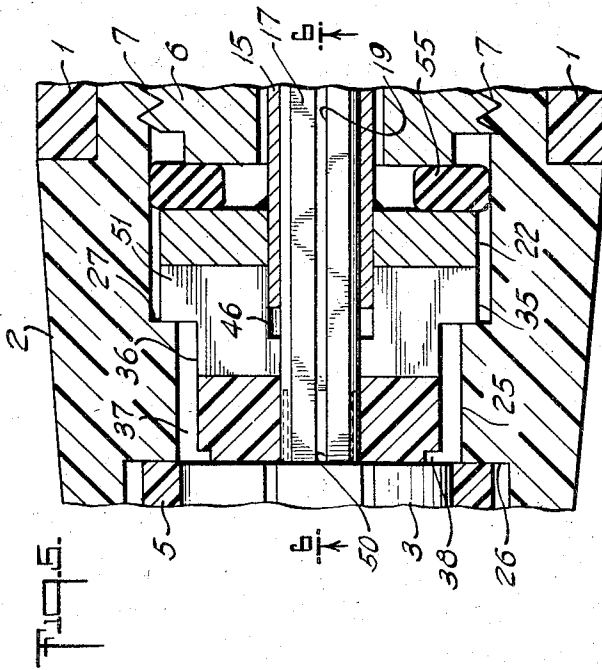
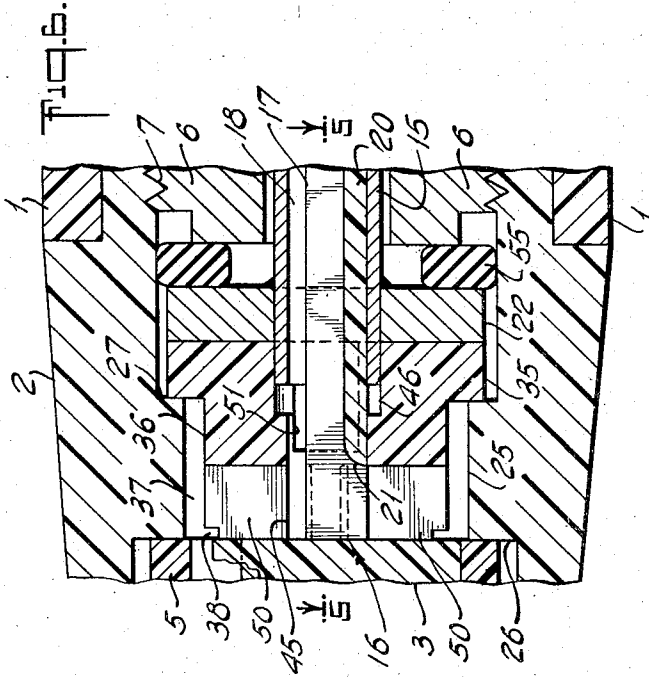
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FOUNTAIN PEN FEED CONSTRUCTION

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FOUNTAIN PEN FEED CONSTRUCTION

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7 Claims. (Cl. 120—50)

This invention relates particularly to fountain pens of the type in which the ink supply located in the barrel has more or less centrally or axially disposed air and ink channels or ducts at its forward or discharge end. A familiar example is the cartridge type pen, in which the forward end of the ink cartridge is penetrated by a tubular member, disposed on the central axis of the pen, which incorporates a feed element suitably formed to provide passage for the ink forwardly, or toward the nib end of the pen, and also for the flow of air in the reverse direction and into the cartridge.

In a common type of fountain pen construction the forward end of the pen, or the section as it is called, carries the nib and a feed or feed unit, the latter incorporating air and ink passages which are offset from or located at one side of the axis of the section and of the pen as a whole.

The object of the present invention is to provide intermediate or connecting feed means so constructed as to enable the central or cartridge type of ink supply means to be used in conjunction with the type of feed unit having the offset air and ink passages, the feed means of the invention providing a simple and ready means of coupling the respective air and ink channels or ducts to insure adequate flow of ink from and air to the supply means by way of the feed unit in the section.

Other objects and advantages of the invention will be apparent from the following description of the accompanying drawings, in which:

Fig. 1 is a side elevation, largely sectioned, of a fountain pen incorporating a preferred form of the invention in an illustrative environment;

Fig. 2 is an enlarged vertical section of the forward end of the pen of Fig. 1;

Fig. 3 is an enlarged transverse section on the line 3—3 of Fig. 2;

Fig. 4 is an enlarged transverse section on the line 4—4 of Fig. 2;

Fig. 5 is a further enlarged section on the line 5—5 of Figs. 2 and 5;

Fig. 6 is a similarly enlarged section on the line 6—6 of Fig. 5; and

Fig. 7 is a broken out perspective view of a feed element.

The illustrated pen consists of a barrel 1, a section 2 and a feed unit 3 mounted in the forward end of the section. The nib 4 is shown as carried by and removable with the feed unit, the sleeve 5 of which is threaded into

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the forward end of the section. A ferrule 6 serves to connect the section and barrel, being threaded at its forward end at 7 where it is engaged with the section and threaded at its rear end at 8 for engagement with the barrel. The barrel houses an ink cartridge 9.

The ink supply means, as that term is used herein, is shown as comprising a centrally or axially located tube 15 which penetrates the ink cartridge and, within the tube, a feed element 16 incorporating air and ink ducts in the nature of grooves or channels. As shown particularly in Figs. 2, 4 and 7, the feed element is of generally circular section but having a flat top surface 17, the resulting space 18 between the feed element and tube 15 constituting the air groove or channel. The feed element is grooved as at 19 to form an ink duct. The web portion 20 of the feed element which unites its two halves terminates (as indicated at 21 in Figs. 6 and 7) short of the forward end of the feed element so that at such forward end the feed element is pierced by an open slot. It may also be noted at this point that the feed element projects beyond the forward end of the tube 15 and that at or adjacent its forward end the tube itself has a flange or flange enlargement 22 secured to it (both details being readily apparent in Fig. 6).

At an intermediate point in its length the section 2 has a restricted throat passage 25 defined or bounded by a forwardly facing shoulder 26 and a rearwardly facing shoulder 27.

The rear end of sleeve 5 of feed unit 3 overlies shoulder 26 and the feed unit incorporates air and ink channels which, at their rear ends, open into the section throat passage 25. These channels are shown particularly in Fig. 3, reference 28 indicating the air channel and reference 29 the ink channels or grooves.

These latter channels, lying beneath the nib, are longitudinally spaced from an axially offset and substantially out of alignment with the more or less centrally located air and ink channels of the ink feed means, and intermediate feed means are provided to connect the respective channels to complete the passages necessary for the flow of ink from the ink supply and of air to that supply. Such intermediate feed means is preferably in the nature of a connecting feed member and is adapted to be mounted in the throat passage 25.

In the present illustrative embodiment, the intermediate feed means comprises a cylindrical plug member having a flange 35 which overlies rearwardly facing shoulder 27 and a reduced diameter body portion 36 projecting into the throat passage 25 but with clearance to leave an annular space 37 around its periphery. The flange is of a diameter to substantially center body portion 36 in the throat passage and the length of the body portion is such that its forward end abuts the rear face of feed unit 3. The extreme forward end of body portion 36 is of still further slightly reduced diameter to form a peripheral groove 38. As will be seen, the groove 38 cuts across and is in communication with the open ends of ink channels 29 at the rear of the feed; and the annular space 37 cuts across and is in communication with the open end of air channel 28 at the rear of the feed.

The intermediate feed plug member is provided with a bore, in this instance a centrally located bore 45 which

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extends clear through it. It is provided also with a counterbore 46, the parts being so dimensioned (see Fig. 6) that when the tube flange 22 abuts plug flange 35, the projecting end of feed element 16 is substantially in contact with the rear face of feed unit 3, the tube terminating within but short of the bottom of counterbore 46. Thus the feed element channels are open to the interior of the plug bore.

The feed plug is provided with additional grooves to complete the air and ink flow passages; that is, to complete the connection between the section channels and the ink supply means channels. Thus, in this form, the forward end face of the plug member is provided with a plurality of radial grooves 50. These serve to connect the forward end of the plug bore 45 with peripheral groove 38 and hence with the feed unit ink channels. The rear end of the plug member is also formed with a deep transverse slot 51 which serves to connect the plug bore with annular space 37 and hence with the feed unit air channel.

The manner of assembly will be self-evident, the feed tube and plug being secured in the section by the threaded ferrule, an intervening washer 55 serving as a seal against the escape of ink into the interior of the ferrule and of the barrel.

It is to be noted that because of the annular arrangement of the intermediate air and ink channels and their connection with the plug bore, the assembly is indifferent to the position in which the plug member is inserted in the throat passage. In other words, the bore is always connected with the feed unit channels, no matter whether the plug member occupies the position indicated or whether it is rotated to any other position in the throat passage. Similarly, the bore is always in communication with the feed element channels.

It will be apparent that the invention may be embodied in numerous forms and variously modified to suit various requirements, the foregoing detailed description being of the preferred embodiment and particularly useful in the environment illustrated. In the light of the foregoing exemplification of the principles of the invention the following is claimed:

1. A fountain pen part comprising a plug member having a substantially axial through bore, and formed at one end with a continuous peripheral end face groove, a radial end face groove intersecting the bore and the peripheral groove, and a transverse slot intersecting the bore and the periphery of the plug member intermediate its ends.

2. In a fountain pen, a hollow section having an intermediate restricted throat passage bounded by forwardly and rearwardly facing shoulders, a plug member abutting the rearwardly facing shoulder and having a reduced portion projecting into but spaced from the wall of the throat passage to form an annular air channel, said plug member also having an annular ink channel formed in the forward end face of its said reduced portion, a feed unit mounted in the forward end of the section abutting the forwardly facing shoulder and also abutting said forward end face of the plug member, said feed unit having an outer longitudinal air passage and an inner longitudinal ink passage in communication respectively with the said annular air and ink channels, said plug member having a substantially central bore, a transverse air slot across its rear face having its ends intersecting the bore and said annular air channel and a transverse slot across its front face intersecting the bore and said annular ink channel, and ink supply means in communication with said bore.

3. In a fountain pen, a hollow member having a feed unit secured within its forward end formed with longitudinal ink and air passages, a chamber within said member at the rear end of said unit, an ink supply tube projecting into the end of said chamber opposite said feed unit, a plug mounted in said chamber so as to be sub-

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stantially fixed against axial displacement with its front end disposed in abutment with the rear end of said feed unit, said plug being formed at its rear end to receive the end of said ink supply tube and being provided with a bore in alignment with and forwardly of the end of said tube, and said plug being formed at its forward end to define with the wall of said chamber a peripheral space open to said feed unit passages, a feed element having ink and air passages extending through said tube to said bore, and transverse ink and air passages in said plug extending between said bore and said space.

4. In a fountain pen, a hollow section member, a barrel removably attached to said section member at one end and containing an ink reservoir, a feed unit secured within the other end of said section member and comprising a nib and longitudinal ink and air passages leading to said nib, said feed member having a flat rear surface and said section member having a chamber rearwardly of said feed unit surface, means defining reservoir connected longitudinal ink and air passages at said one end of said section opening into said chamber and disposed substantially at the longitudinal axis of said feed unit, the longitudinal passages in said feed unit being radially outwardly displaced with respect to said reservoir connected passages, and means in said chamber interposed longitudinally between said feed unit and reservoir connected passages for connecting the respective ink and air passages to provide for effectively continuous ink and air passage between the nib and reservoir comprising an internal member disposed in said chamber, said internal member having a flat front surface, means mounting said internal member in said chamber with said front surface abutting the rear surface of said feed member, said internal member being formed at its rear end to receive said reservoir connected passage defining means and formed with transverse passage means interconnecting said reservoir connected passages with the adjacent ends of said feed unit passages, and the transverse ink passage means being at least one groove formed in said front surface of said internal member.

5. In the fountain pen defined in claim 4, said interconnecting passage means comprising a circumferential passage into which the outer end of said transverse passage means is open, said circumferential passage being continuous and open to the adjacent ends of said feed unit passages in all positions of rotation of said internal member about the longitudinal axis of said chamber.

6. In a fountain pen, a hollow member having a feed unit secured within its forward end formed with longitudinal ink and air passages, a chamber within said member at the rear end of said unit, an ink supply tube projecting into the end of said chamber opposite said feed unit, a plug in said chamber formed at its rear end to receive the end of said ink supply tube and provided with a bore in alignment with and forwardly of the end of said tube, said plug being formed at its forward end face with a peripheral groove to define with the wall of said chamber a peripheral space open to said feed unit passages, a feed element having ink and air passages extending through said tube into said bore, transverse ink and air passages in said plug extending between said bore and said space, an enlarged flange on said tube within said chamber, said plug being mounted in abutment at opposite ends with said flange and said feed unit, and said transverse passages comprising substantially radial end face grooves in said plug all opening into said circumferential plug end face groove that bridges the adjacent ends of said feed unit passages.

7. In a fountain pen, a hollow member having a feed unit secured within its forward end formed with longitudinal ink and air passages, a chamber within said member at the rear end of said unit, an ink supply tube projecting into the end of said chamber opposite said feed unit, a plug in said chamber formed at its rear end to receive the end of said ink supply tube and provided with

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a bore in alignment with and forwardly of the end of said tube, said plug being formed at its forward end to define with the wall of said chamber a peripheral space open to said feed unit passages, a feed element having ink and air passages extending through said tube into said bore, transverse ink and air passages in said plug extending between said bore and said space, said space including a peripheral end face groove in said plug, and at least one of said transverse passages being a radial end face groove in said plug intersecting said bore and said peripheral groove, and another transverse passage in said plug extending between said space and said plug bore to intersect said plug bore between the end of said tube and said radial end grooves.

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