

July 31, 1956

C. J. LAMY

2,756,722

FOUNTAIN PEN STRUCTURE

Filed April 29, 1953

2 Sheets-Sheet 1

Fig. 1

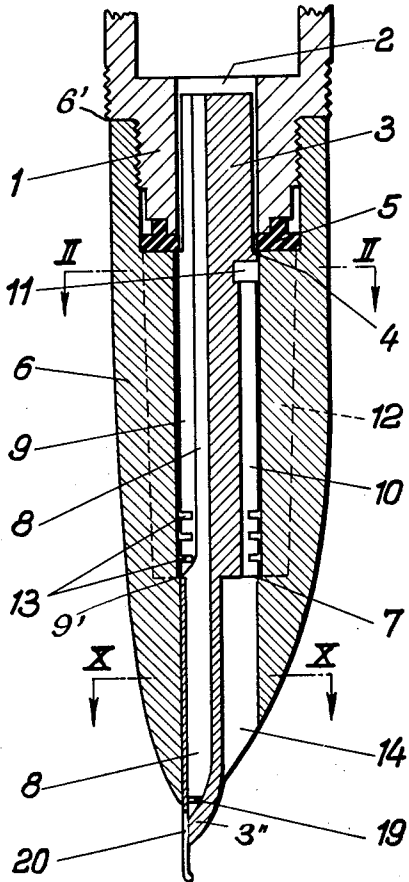


Fig. 2

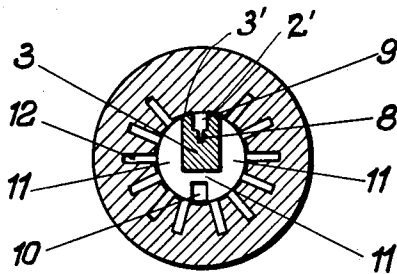


Fig. 3

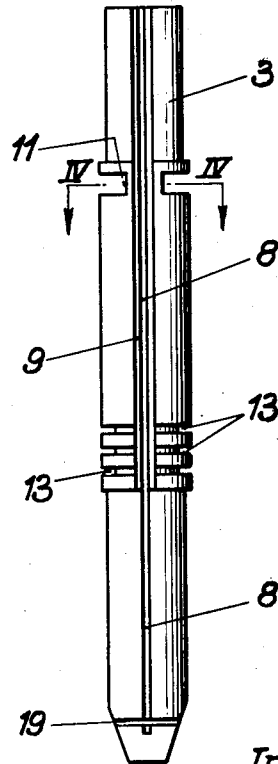
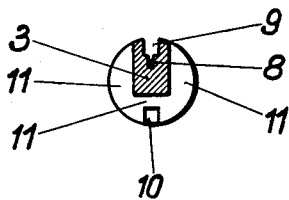


Fig. 4



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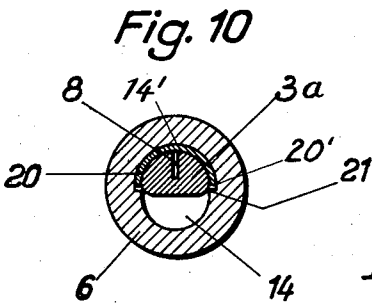
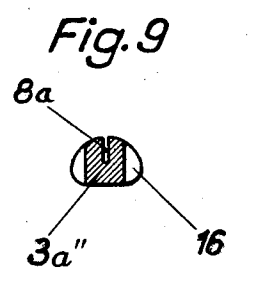
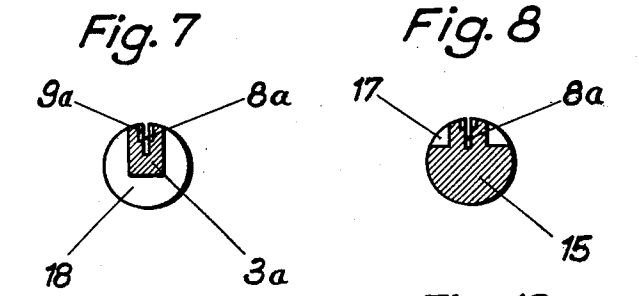
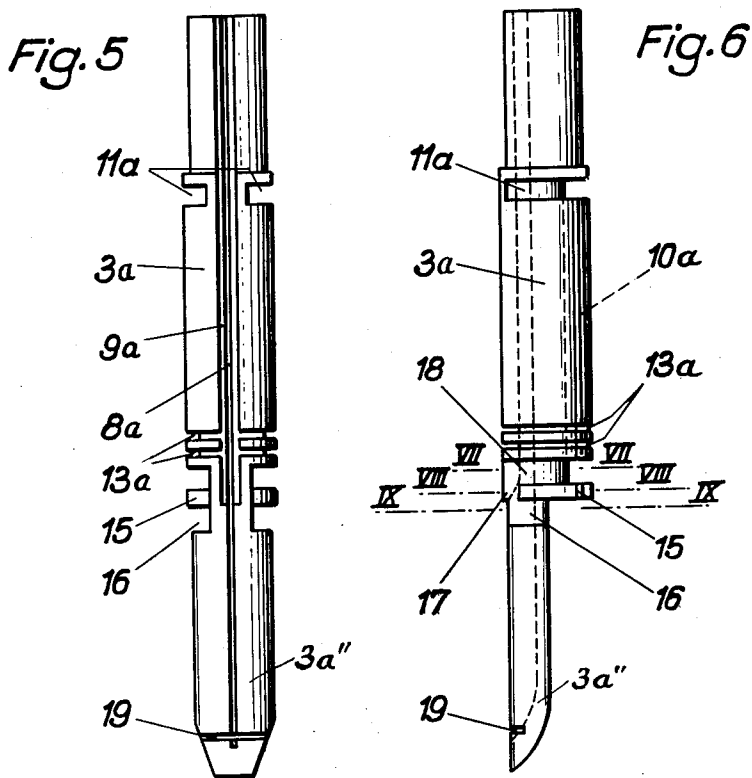
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2 Sheets-Sheet 2



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FOUNTAIN PEN STRUCTURE

Carl Josef Lamy, Heidelberg, Germany

Application April 29, 1953, Serial No. 351,899

Claims priority, application Germany May 8, 1952

9 Claims. (Cl. 120—52)

The present invention relates to fountain pens, and more particularly to the arrangement of equalizing capillary channels in a fountain pen.

It is the object of the present invention to provide in a fountain pen equalizing capillary channels preventing an undesired flooding of the feed duct due to temperature and atmospheric pressure conditions.

It is another object of the present invention to provide a fountain pen structure in which the desired amount of ink is supplied to the nib through a feed duct regardless of the prevailing temperature and atmospheric pressure.

It is a further object of the present invention to provide in a fountain pen air ducts and ink feed ducts connected by transverse capillary conduits with equalizing channels so that an undesired surplus of ink in the feed duct is drawn into the equalizing channels.

It is a still further object to provide in a fountain pen a feeder having plurality of equalizing capillary channels, and to supply air to the same through a transverse air conduit communicating with a longitudinal air duct which opens to the outside air.

It is another object of the present invention to provide a deflecting plate in the longitudinal air duct means of the fountain pen.

It is still another object of the present invention to support the nib of a fountain pen on a feeder means having a longitudinal open ink feed duct and a transverse air groove adjacent the forward end of the feeder means.

With these objects in view the present invention mainly consists in a fountain pen comprising, in combination, an elongated barrel front end portion formed with an axial bore and with capillary equalizing channels opening into said bore and an elongated feeder portion located in the bore of the barrel and being formed with a feed duct. Transversely extending capillary conduits connect the feed duct with the equalizing channel.

According to a preferred embodiment, the present invention mainly consists in a fountain pen structure comprising, in combination, a barrel having a threaded front end; an elongated hood threadedly connected to the barrel front end, and formed with an axial bore bounded by a cylindrical inner surface having at the forward end thereof an inner shoulder, the inner surface being formed with a plurality of capillary channels extending in longitudinal direction, elongated feeder means located in the bore and clamped between the barrel front end and the inner shoulder of the cap, the feeder means having a longitudinally extending outer surface portion fluid-tightly engaging an elongated portion of the inner surface and being formed with at least one longitudinally extending feed duct composed of a wider outer air duct closed at the front end thereof, and an inner capillary ink duct extending in forward direction beyond the closed end of the air duct, the feeder means being also formed with a longitudinally extending air duct open at the front end thereof for communication with the outside air, the air duct being located diametrically spaced from the feed duct, the feeder means

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having a front end portion formed with a peripheral transversely extending capillary conduit connecting the feed duct with the air duct and with the capillary channel, the feeder means having a rear end portion formed with a peripheral transversely extending air conduit connecting the air duct with the capillary channel, and a deflecting plate located in the bore, and secured to the feeder means forwardly of the transverse capillary conduit and projecting across the open front end of the air duct so that air entering the bore of the barrel front end portion is deflected before entering the air duct.

Preferably said capillary channels are deeper at the rear end thereof.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

Fig. 1 is a longitudinal sectional view through the front end portion of a fountain pen;

Fig. 2 is a cross sectional view on line II—II in Fig. 1;

Fig. 3 is a front view of the feeder means according to the present invention;

Fig. 4 is a cross sectional view on line IV—IV in Fig. 3;

Fig. 5 is a front view of the feeder means according to a modified embodiment of the present invention;

Fig. 6 is a side view of the feeder means shown in Fig. 5;

Fig. 7 is a cross sectional view on line VII—VII in Fig. 6;

Fig. 8 is a cross sectional view on line VIII—VIII in Fig. 6;

Fig. 9 is a cross sectional view on line IX—IX in Fig. 6; and

Fig. 10 is a cross sectional view on line X—X in Fig. 1.

Referring now to the drawings and more particularly to Fig. 1, the barrel front end portion of a fountain pen according to one embodiment of the present invention consists of the threaded front end 1 of the barrel main portion and of a hood 6 which is threadedly connected to the barrel front end 1. The entire front end portion is formed with a bore 2 which partly extends in the barrel portion 1 and partly in the hood 6. Feeder means 3 is located in the bore 2 and provided with an annular shoulder 4 abutting against a resilient sealing ring 5 which is clamped between the members 1 and 6. The feeder means 3 is clamped to the sealing ring 5 and the barrel front end 1 by means of the inner shoulder 7 of the hood 6.

The resilient sealing and compensating ring 5 assures a reliable attachment of the feeder means 3 as well as a tight and flush engagement of the annular rear face 6' of the hood 6 with a corresponding shoulder at the front end of the barrel 1 regardless of slight dimensional inaccuracies.

Feeder means 3 is provided with a feed duct 8, 9 which is composed of one or two ink ducts 8 which extend longitudinally from the rear end portion of feeder means 3 to adjacent the front end thereof which supports the nib 20. Nib 20 is inserted into an arcuate depressed portion 14' of the bore 2 in the hood 6, and has longitudinal side edges 20' engaging inner shoulders 21 in the hood 6, as can be best seen from Fig. 10. The shoulders 21 prevent turning of the nib 20 relative to the hood 6 and to the feeder means 3.

The feed duct includes an air duct 9 which is wider than the capillary ink duct 8 and has a closed front end 9'. Another air conduit 10 is located diametrically with

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respect to the feed duct 8, 9, and communicates at the forward end thereof with the portion 14 of the bore 2. A peripheral air conduit 11 extending transverse to air conduit 10, as best seen in Fig. 2, connects the air conduit 10 with the equalizing longitudinally extending capillary channels 12 which radially project into the hood 6 from the cylindrical surface of the bore 2. The air duct 9 is provided in a longitudinally extending surface portion 3' of the feeder means which fluid tightly engages a portion 2' of the cylindrical surface of the bore 2. This surface portion 2' is not provided with equalizing capillary channels 12.

The connection between the capillary channels 12 and the feed duct 8, 9 is established by capillary peripheral conduits 13 which are preferably located in the front end portion of feeder means 3. The equalizing channels 12 are deeper at the rear end thereof, so as to have a stronger action when the fountain pen is in writing position with the front end pointed downwardly.

Any undesirable surplus of ink which might collect in the feed duct, particularly in the air duct 9, will be drawn through the transverse peripheral capillary conduit 13 into the equalizing channels 12 which are provided with air through the transversely extending conduit 11, which communicates through air duct 10 and bore portion 14 with the outside. It should be noted that the only connection between the equalizing channels 12 and the feed duct 8, 9 is established by the capillary conduit 13. The deeper rear ends of the capillary channels 12 are connected by the air conduit 11, 11a.

According to a modified embodiment of the present invention shown in Figs. 5 to 10, a deflecting plate 15 is arranged on feed means 3a forwardly of the open end of the air duct means 10a. The deflecting plate 15 closes a major part of the bore 2 forcing the air entering through the bore portion 14 to pass through the cut outs 16 shown in Fig. 9 in transverse direction, then rearwardly through the cut outs 17 shown in Fig. 8, and then transversely again through the air space 18 shown in Fig. 7 to enter the forward end of the air duct 10a.

The deflecting or shielding plate 15 prevents leaking or squirting of ink out of the fountain pen, and also considerably reduces the formation of condensate in the rear portion of the fountain pen. Ink leaking down in forward direction through the air duct means 10a is prevented from entering the bore portion 14 of hood 6 in which this embodiment of feeder means is insertable in the same way as the previously described embodiment by the shielding plate 15 which blocks direct passage of ink, while permitting the deflected air to pass into the pen. Also, the shielding plate 15 prevents undesirable drying of ink in the capillary channels 12 in the event that the fountain pen is not used for a considerable time.

Preferably the foremost portion 3'' or 3a'' of the feeder means 3 or 3a respectively, which has a reduced cross section as shown in Fig. 10, is provided with a transverse groove 19 or 19a, see Figs. 3, 5 and 6 which not only improves the uniform distribution of ink over the point of the nib 20, but also facilitates drawing of ink into the fountain pen when the same is filled. Moreover, groove 19 or 19a assures a tight abutment between the nib 20 and the feeder portion 3'' or 3a'' since it permits a slight yielding of the point of the feeder portion 3'' which is particularly advantageous if the point of the nib is slightly bent.

As in the earlier described embodiment, the connection between the capillary channels 12a and the feed duct 8a, 9a is established by capillary peripheral conduits 13a which are preferably located in the front end portion of feeder means 3a.

While the invention has been illustrated and described as embodied in a fountain pen structure provided with equalizing capillary channels and a deflecting plate in an air conduit, it is not intended to be limited to the details shown, since various modifications and structural changes

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may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention, and therefore such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. In a fountain pen, in combination, an elongated barrel front end portion formed with an axial bore bounded by a cylindrical inner surface, said inner surface being formed with a plurality of capillary channels extending in longitudinal direction; and elongated feeder means located in said bore and having a longitudinally extending outer surface portion fluid-tightly engaging an elongated portion of said inner surface and being formed with at least one longitudinally extending feed duct composed of a wider outer air duct closed at the front end thereof and an inner capillary ink duct extending in forward direction beyond said closed end of said air duct, said feeder means being also formed with a wide longitudinally extending air passage open at the front end thereof for communication with the outside air, said air passage being located peripherally spaced from said feed duct, said feeder means having a portion formed with a peripheral capillary conduit means connecting said front end of said air duct with said air passage and with said capillary channel, said feeder means having a rear end portion formed with a peripheral air conduit connecting said air passage with said capillary channels.

2. In a fountain pen, in combination, an elongated barrel front end portion formed with an axial bore bounded by a cylindrical inner surface, said inner surface being formed with a plurality of capillary channels extending in longitudinal direction, said capillary channels being deeper at the rear end thereof; and elongated feeder means located in said bore and having a longitudinally extending outer surface portion fluid-tightly engaging an elongated portion of said inner surface and being formed with at least one longitudinally extending feed duct composed of a wider outer air duct closed at the front end thereof and an inner capillary ink duct extending in forward direction beyond said closed end of said air duct, said feeder means being also formed with a wide longitudinally extending air passage open at the front end thereof for communication with the outside air, said air passage being located diametrically spaced from said feed duct, said feeder means having a portion formed with peripheral capillary conduits connecting said front end of said air duct with said air passage and with said capillary channels, said feeder means having a rear end portion formed with a peripheral transversely extending air conduit connecting said air passage with said capillary channels.

3. In a fountain pen, in combination, an elongated barrel front end portion formed with an axial bore bounded by a cylindrical inner surface, said inner surface being formed with a plurality of capillary channels extending in longitudinal direction; elongated feeder means located in said bore and having a longitudinally extending outer surface portion fluid-tightly engaging an elongated portion of said inner surface and being formed with at least one longitudinally extending feed duct composed of a wider outer air duct closed at the front end thereof and an inner capillary ink duct extending in forward direction beyond said closed end of said air duct, said feeder means being also formed with a wide longitudinally extending air passage open at the front end thereof for communication with the outside air, said air passage being located diametrically spaced from said feed duct, said feeder means having a portion formed with peripheral capillary

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conduits connecting said front end of said air duct with said air passage and with said capillary channels, said feeder means having a rear end portion formed with a peripheral air conduit connecting said air passage with said capillary channels; and a shielding plate means located in said bore, being secured to said feeder means forwardly of said peripheral capillary conduits and projecting across said open front end of said air passage so as to prevent passage of ink squirted from said capillary channels.

4. In a fountain pen, in combination, a hollow barrel having a threaded front end; an elongated hood threadedly connected to said barrel front end, and being formed with an axial bore bounded by a cylindrical inner surface having at the forward end thereof an inner shoulder, said inner surface being formed with a plurality of capillary channels extending in longitudinal direction; elongated feeder means located in said bore and clamped between said barrel front end and said inner shoulder of said hood, said feeder means having a longitudinally extending outer surface portion fluid-tightly engaging an elongated portion of said inner surface and being formed with at least one longitudinally extending feed duct composed of a wider outer air duct closed at the front end thereof and an inner capillary ink duct extending in forward direction beyond said closed end of said air duct, said feeder means being also formed with a wide longitudinally extending air passage open at the front end thereof for communication with the outside air, said air passage being located diametrically spaced from said feed duct, said feeder means having a portion formed with peripheral capillary conduits connecting said front end of said air duct with said air passage and with said capillary channels, said feeder means having a rear end portion formed with a peripheral air conduit connecting said air passage with said capillary channels; and a shielding plate means located in said bore, being secured to said feeder means forwardly of said peripheral capillary conduits and projecting across said open front end of said air passage so as to prevent passage of ink squirted from said capillary channels.

5. A fountain pen structure as claimed in claim 4 and including a resilient sealing ring located between said barrel front end and said hood and said feeder means.

6. A fountain pen structure as claimed in claim 1 and including a nib supported on the forward end of said feeder means closing said feed duct and having a pair of longitudinal side edges; and wherein said barrel front end portion is provided with a pair of longitudinally extending shoulders in said bore engaging the side edges of said nib.

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7. In a fountain pen, in combination, an elongated barrel front end portion formed with an axial bore bounded by a cylindrical inner surface, said inner surface being formed with a plurality of peripherally spaced longitudinally extending capillary channels; elongated feeder means located in said bore and having an outer surface portion fluid-tightly engaging a portion of said inner surface and being formed with at least one longitudinally extending feed duct composed of a wider outer air duct closed at the front end thereof and of an inner capillary ink duct having a forwardly located ink duct end portion extending in forward direction beyond said closed end of said air duct, said outer surface of said feeder means being also formed with a wide longitudinally extending air passage open at the front end thereof and being located peripherally spaced from said feed duct, said feeder means being formed with a peripheral capillary conduit connecting said front end of said air duct with said air passage and with the forward ends of said capillary channels, said feeder means having a rear end portion formed with a peripheral air conduit in said outer surface thereof connecting said air passage with said capillary channels; and a nib located in said axial bore between said barrel front end portion and said feeder means forwardly of said closed end of said air duct and of said peripheral capillary conduit and closing said forwardly located ink duct end portion.

8. A fountain pen as claimed in claim 7 wherein said nib has a pair of longitudinal side edges, and wherein said barrel front end portion has a pair of longitudinally extending shoulders in said bore engaging said side edges of said nib.

9. A fountain pen as claimed in claim 7 and including a shielding plate located in said bore and being secured to said feeder means forwardly of said peripheral capillary conduit and projecting across said open front end of said air passage so as to prevent passage of ink squirted from said capillary channels.

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