

Oct. 6, 1970

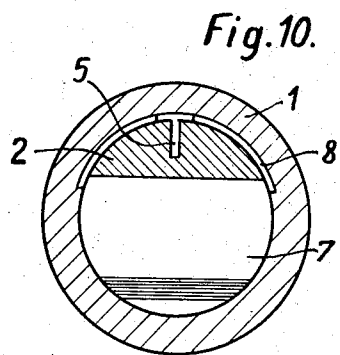
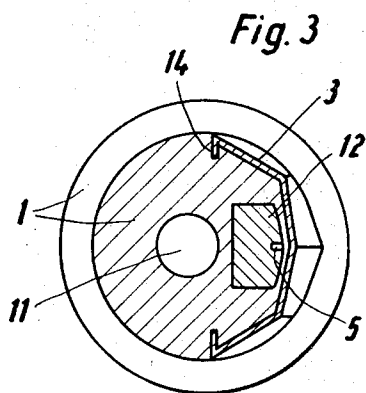
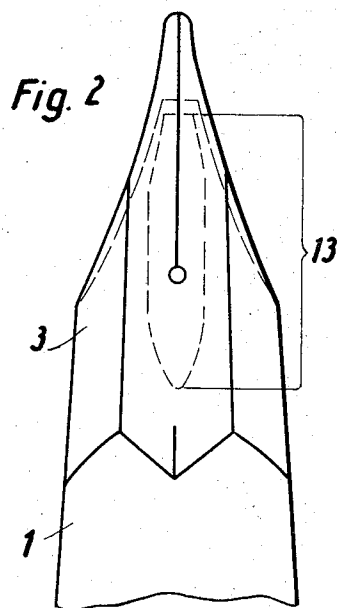
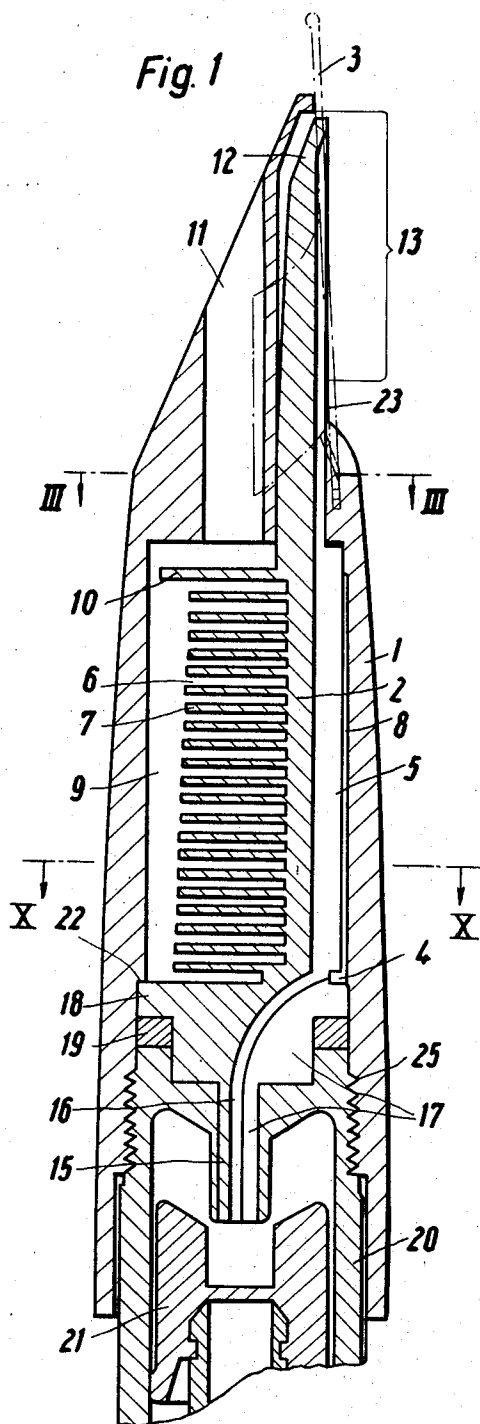
F. KÖNIG

3,532,436

FEED BAR FOR FOUNTAIN PENS

Filed Dec. 4, 1967

2 Sheets-Sheet 1



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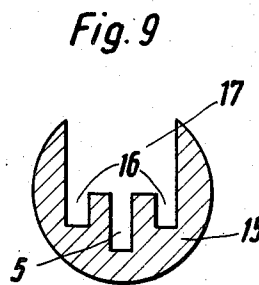
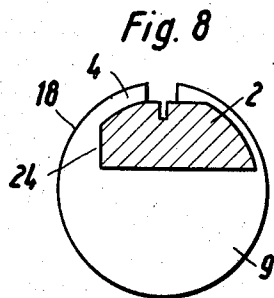
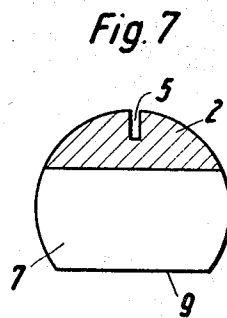
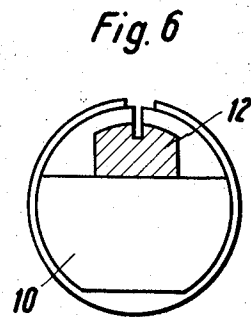
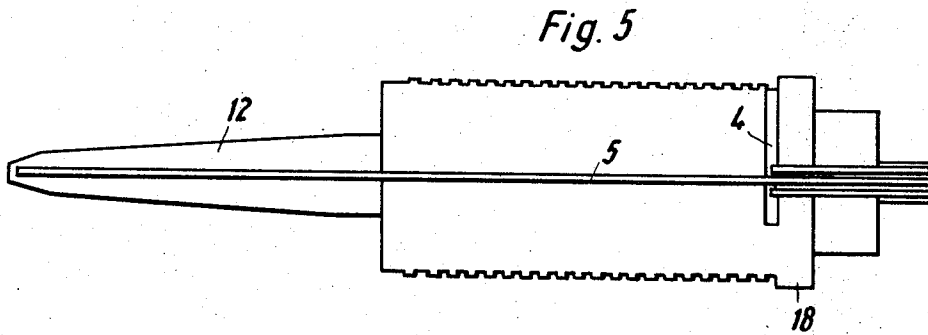
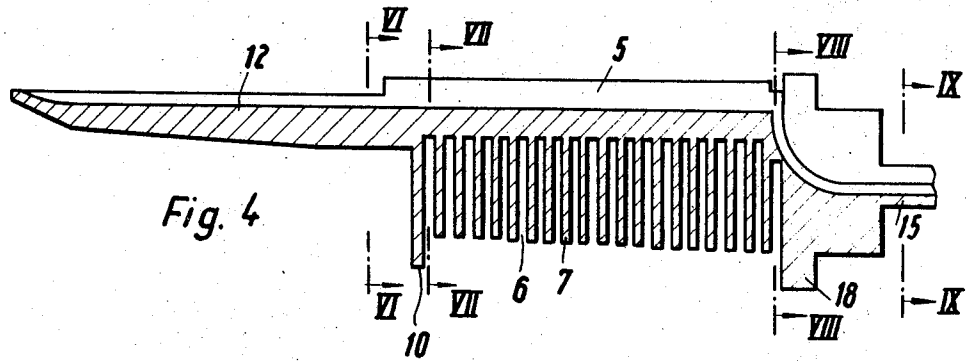
F. KÖNIG

3,532,436

FEED BAR FOR FOUNTAIN PENS

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2 Sheets-Sheet 2



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1

3,532,436

FEED BAR FOR FOUNTAIN PENS

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U.S. Cl. 401—227

6 Claims

ABSTRACT OF THE DISCLOSURE

An ink reservoir and a fountain pen front portion with a nib and feed bar in a single integral unitary member having a feed control channel. A longitudinal capillary groove connects the feed control channel to the underside of the nib. Ink pockets are formed by fins separated by capillary slots. An air channel including an inner section, a middle section and an outer section establishes communication between the feed control channel and ink pockets. The middle section extends underneath fins axially throughout the entire length of the pocket arrangement diametrically opposite the longitudinal capillary groove. The outer section of the air channel is a bore communicating with the outside and radially offset from the middle section. The inner end of this bore is covered by one of the fins facing the bore in close juxtaposition thereto and creating a kind of labyrinth. The feed bar also is provided with semicylindrical capillary gap means establishing communication between the ink pockets and the longitudinal capillary groove.

The invention relates to a feed bar for fountain pens containing a feed control channel from the ink reservoir for conveying air and ink in opposite directions, a longitudinal capillary groove connecting the feed control channel to the underside of the nib, an assembly of ink pockets formed by capillary slots separated by fins and communicating with the longitudinal capillary groove, and an air channel leading to the feed control channel.

The object of the present invention is the provision of an ink feed bar which by virtue of a combination of features of which some are individually known makes the fountain pen particularly safe against spillage of ink when shaken and in practice prevents ink from being discharged axially even when the pen is subjected to violent impact shock.

It is another object of the invention to provide a particularly simple and cheap form of construction which will facilitate the assembly and also will permit the nib of the pen to be subsequently exchanged by people who are not highly skilled.

These and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawings, in which:

FIG. 1 shows on an enlarged scale an axial section of the front end of a fountain pen according to the invention;

FIG. 2 is a top view of the end of the pen in FIG. 1 carrying the nib;

FIG. 3 is a cross section taken on the line III—III in FIG. 1;

FIG. 4 is an axial section of the feed bar in the fountain pen according to FIG. 1;

2

FIG. 5 is a view of the feed bar from above;

FIG. 6 is a cross section taken on the line VI—VI in FIG. 4;

FIG. 7 is a section taken on the line VII—VII in FIG. 4;

FIG. 8 is a section taken on the line VIII—VIII in FIG. 4;

FIG. 9 is a section taken on the line IX—IX in FIG. 4;

FIG. 10 is a section taken on the line X—X in FIG. 1.

The feed bar according to the present invention is characterized primarily in that the air channel comprises an inner, a middle and an outer section, and that the inner section of said air channel leads from the feed control channel to the inner end of the ink pocket chamber while the middle section of said air channel extends underneath fins of diminishing height axially through the entire ink pocket chamber diametrically opposite the longitudinal capillary groove, whereas the outer section of said air channel is a bore which communicates with the outside and which is radially offset from the middle section, the inner end of said bore being covered by a fin facing the bore in close juxtaposition thereto and creating a kind of labyrinth while the ink pocket chamber communicates throughout its length with the longitudinal capillary groove through a semicylindrical capillary gap.

The outstanding safety characteristics of a fountain pen fitted with the proposed feed bar, which prevents ink from being discharged when the pen is shaken, stems from the provision of the longitudinal capillary groove which is covered along its entire length, and from the creation of a completely separate path for the air, as well as from the presence of a transverse baffle in the air channel. These arrangements do not in any way impair the ability of the ink pocket assembly to retain and yield ink since the ink pocket chamber communicates via a semicylindrical capillary gap with the longitudinal capillary groove and is sufficiently well vented.

Preferably the feed bar may be of integral construction and directly enclosed by the front part of the fountain pen carrying the nib, the elastic beak of the feed bar containing the longitudinal capillary groove projecting beyond the ink pocket assembly and being elastically biased to bear through an opening in the front part of the fountain pen against the underside of the nib. Another feature of the invention which further enhances the spilling safety of the fountain pen consists in that the feed control channel is a transverse channel in the shaft portion of the feed bar, extending peripherally from the inner section of the air channel to the longitudinal capillary groove.

Referring now to the drawings in detail, FIG. 1 shows on an enlarged scale the forward end 1 of a fountain pen which contains a fully enclosed single-part feed bar comprising a feed bar shaft 2, tongue or beak 12 and stud or heel 15. A longitudinal capillary groove 5 through which ink is conveyed from the reservoir 20 to the nib extends along the length of the feed bar from a feed control channel 4 to the nib 3 which is fitted into the forward end 1 of the fountain pen.

Adjacent to, and in horizontal position of the pen, below the feed bar shaft 2, is an assembly of ink pockets formed by transverse capillary slots 6 between fins 7. This ink pocket assembly communicates through a semicylin-

3

dricapillary gap 8 in the forward part of the pen with the longitudinal capillary groove 5.

The ink pocket assembly and the feed control channel 4 are vented by an air channel comprising an inner, a middle and an outer section. The outer section is formed in the front part 1 of the pen by an axial bore 11 which is covered at its inner end by a relatively closely juxtaposed fin 10 on the feed bar forming a baffle. The middle section 9 of the air channel extends through the entire length of the ink pocket assembly below fins 7 of diminishing length. The inner end of the middle section 9 of the air channel communicates through a channel 24 in the feed bar shaft 2 with the feed control channel 4.

The feed control channel 4 through which air and ink can pass in opposite directions extends peripherally around the feed bar shaft 2 (FIG. 5) and enters the longitudinal capillary groove 5 directly adjacent the fitting flange 18 of the feed bar. From the feed control channel, the longitudinal capillary groove 5 as well as two parallel lateral capillaries 16 and an air channel 17 lead in an arcuate path into the ink reservoir 20 proper.

The ink reservoir 20 is screwed at 25 into the front part of the pen from the back. The peripheral flange 18 which bears against a shoulder 22 in the front part 1 of the pen and an interposed washer 19 provide a reliable seal to the outside and exactly align the feed bar inside the front part 1 of the pen.

At the forward end of the front part 1 of the pen, above the air vent 11, there is an opening 13 (FIGS. 1 and 2) through which the elastic beak 12 of the feed bar containing the longitudinal capillary groove 5 projects to bear against the underside of the nib 3. The upper edge 23 of the front part 1 of the fountain pen is slightly inclined towards the fountain pen axis so that the axial beak 12 of the feed bar 2 extends slightly beyond the edge after having passed through the front part 1 and bears with a slight elastic bias against the underside of the nib 3. This ensures that the longitudinal capillary groove 5 will maintain contact with the nib and hence ensure a continuous feed of ink even when maximum pressure is applied to the nib.

The rear part of the feed bar 2 forms a heel 15 (FIGS. 1 and 9) through which the main capillary groove 5, the two lateral capillaries 16 and the air channel 17 extend into the ink reservoir 20. The heel 15, provided the ink reservoir 20 is suitably constructed, permits the same front part of the fountain pen and the same feed bar to be used both for self-filling plunger type pens and for pens adapted to receive cartridge refills. In the illustrated example the illustrated pen is of the self-filling plunger type in which the plunger 21 has a socket-shaped axial recess roughly adapted to conform with the shape of the rear end of the heel 15. This arrangement permits the annular cavity surrounding the heel 15 to be used a reserve ink container from which ink can be drawn when the fountain pen has been emptied in the normal way and the plunger 21 is pushed forward. The forward movement of the plunger displaces the ink from the annular cavity and presses it through the heel 15 into the front part 1 of the pen and the ink pockets.

The nib 3 is fitted to the front part 1 of the fountain pen from the outside. It is accurately shaped and held in lateral slits 14, as shown in FIG. 3. This permits retailers of fountain pens to replace nibs when required without special difficulties.

During use of the pen, the ink from the ink reservoir 20 flows through the capillaries 16 and 5 to the underside of the nib. The flow of ink is controlled by the passage of air through the feed control channel 4 which the ambient air can reach through the bore 11 and the channels 9 and 24 (FIG. 8). Since the longitudinal capillary groove 5 communicates with the ink pockets through the semicylindrical capillary gap 8, the collecting pockets fill evenly and the intercepted volume of ink is properly withdrawn or emptied into the ink chamber when the fountain pen is held

4

upright or when air pressure and temperature change. The separation of the air channel from the longitudinal capillary groove in the front and middle portions of the feed bar, the complete enclosure of the longitudinal capillary groove, the baffle 10 in the air channel and the transverse feed control channel all cooperate to prevent escape of ink upon shaking the pen and to satisfy the highest demands in this respect.

It is, of course, to be understood that the present invention is by no means, limited to the particular construction shown in the drawings, but also comprises any modifications within the scope of the invention.

What I claim is:

1. A fountain pen having an ink reservoir and a front portion with a nib, a feed bar including: a feed control channel for communication with the ink reservoir to conduct air and ink in opposite directions, a longitudinal capillary groove formed by crossbars and capillary groove defining means for connecting the feed control channel at the topside of the fountain pen to the underside of the nib, an assembly of ink pockets formed by fins separated by capillary slots and communicating with said longitudinal capillary groove and means forming a noncapillary venting chamber in communication with the outside and with the ink pockets, the venting chamber extending from the ink feed bar underside longitudinally to the ink-reservoir-side end of the ink pocket assembly and supplying a dosage regulating path for venting access to the ink reservoir which communicates with an enlargement of the longitudinal capillary groove and including an air channel leading to said feed control channel, said air channel comprising an inner section, a middle section and an outer section, said inner section establishing communication between said feed control channel and said ink pockets while said middle section of said air channel extends underneath said fins axially throughout the entire length of said feed assembly diametrically opposite said longitudinal groove, and the outer section of said air channel comprising a bore communicating with the outside and being radially offset from the middle section of said air channel, the inner end of said bore being covered by one of said fins facing the bore in close juxtaposition thereto and creating a kind of labyrinth, said feed bar also being provided with semicylindrical capillary gap means simultaneously establishing full length communication between space of said ink catching pockets and said longitudinal capillary groove with which the feed bar bore and fountain pen front portion communicates.

2. A fountain pen having a feed bar according to claim 1, for insertion into a fountain pen the front part of which has an opening, which includes an elastic tongue containing said longitudinal capillary groove and projecting beyond said ink pocket assembly, said feed bar being insertable into said fountain pen so that said elastic tongue is elastically biased to bear against the underside of the nib and the upper side of said elastic tongue forms an acute angle with respect to nib bed location upon removal of said nib.

3. A fountain pen having a feed bar according to claim 1, in which said feed control channel is exclusively a transverse channel in a shaft portion of the feed bar, the feed control channel progressively extending peripherally from the inner section of the air channel to the longitudinal capillary groove.

4. A fountain pen having a feed bar according to claim 1, in which its rear end has a stud projecting into the ink reservoir for collectively defining a ring-shaped ink reservoir space between said stud and cylindrical wall reservoir formation and for cooperation with the socketed end of a plunger therein to form supplementary ink catching pockets capable of being emptied by shifting said plunger though otherwise the ink content therein is unusable for writing purposes.

5. A fountain pen having a feed bar according to claim 3, in which a single feed control channel exclusively ex-

5

tending in transverse direction is provided at ink reservoir end location at a level lying adjoining the last catching pocket.

6. A fountain pen having a feed bar according to claim 1, in which the outer end of the middle section of the air channel is a radially offset outwardly extending bore, and a fin serving as a baffle with close juxtaposition spacing for labyrinth uncovering of an inner end of said offset outwardly extending bore. 5

6

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LAWRENCE CHARLES, Primary Examiner