March 6, 1928. 1,661,225

T. KOVÁCS

FOUNTAIN PEN

Filed March 6. 1926

FIG. 1.

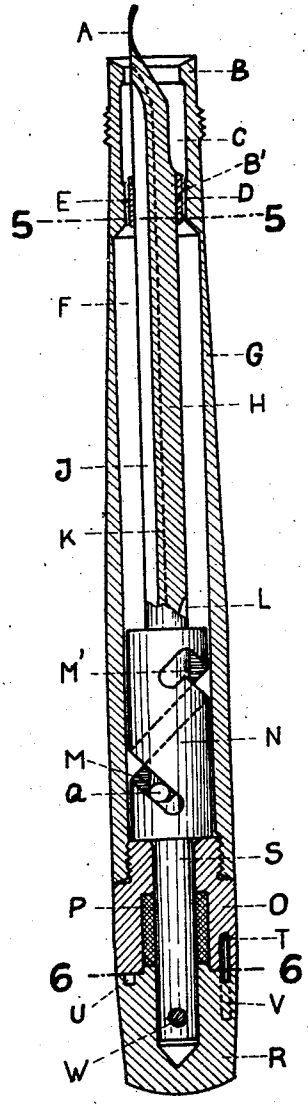


FIG. 2.

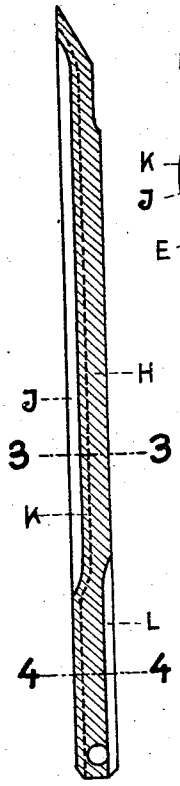


FIG. 5.

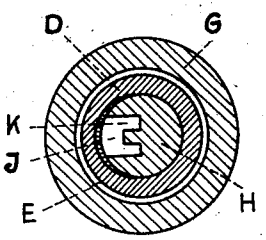


FIG. 3.

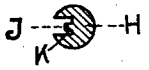


FIG. 4.

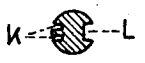
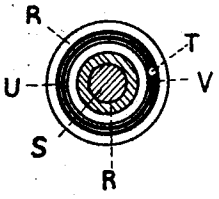


FIG. 6.



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UNITED STATES PATENT OFFICE.

THEODOR KOVÁCS, OF BERLIN, GERMANY.

FOUNTAIN PEN.

Application filed March 6, 1926, Serial No. 92,807, and in Germany March 3, 1925.

My invention relates to fountain-pens, more particularly to a safety-pen. It is an object of my invention to provide means for filling the reservoir through the opening of the holder in the partly advanced and preferably also in the retracted position of the nib without allowing ink to escape from the reservoir.

In fountain-pens as hitherto designed and in which the ink holder is closed by the ring holding the nib, when the nib is retracted, filling is effected either by means of a rubber tube inserted in the holder, or else the upper portion of the ink holder is removed before refilling the pen. In both these cases the ink holder proper is composed of at least two separate parts.

The fountain-pen according to the present invention is designed like a normal safety-pen, the ink holder proper being made in one piece. Also in the new pen the ink holder, when the nib is retracted, is closed by the nib-holding ring, thereby preventing leakage, however, means are provided whereby it can be filled from without exactly like a normal safety-pen. I achieve this according to the present invention by so dimensioning the passages for air and ink leading across and around the nib-holding ring that the holder can be filled through its mouth when the nib is halfway advanced and preferably also when it is retracted.

In the first case the diameter of the holder above the closure is so much larger that with the nib partly advanced ink and air can simultaneously pass through in opposite directions between the nib-holding ring and the wall of this part of the holder, which for the purposes of this description shall be styled the antechamber. In the second case, when the nib is retracted, provision is made for the escape of the air displaced during the filling operation and a clearance is provided between the cooperating faces of the closing members, this clearance being so dimensioned as to allow ink to pass through, while preventing the passage of air when blocked by ink.

I prefer so designing my improved fountain-pen that it can be filled in both positions of the nib. This enables the pen to be washed with the nib partly advanced, while such ink as may have leaked into the antechamber, is free to return to the reservoir when the nib has been retracted.

In order to enable the air which is expelled on filling while the nib is in its retracted position to escape, I make the air passage in the feed bar comprising the capillary ink grooves comparatively wide and I extend these grooves so far as to prevent the trapping of ink in the vicinity of the pen-holding ring. Preferably the capillary grooves of the feed bar extend down to the cam sleeve by which this bar is reciprocated or even further, when the bar is in its advanced position, in order to expedite the flowing back of the ink into the cavities of the cam sleeve, when retracting the bar, and to utilize the ink which fills these cavities. When writing, the ink oozes from these cavities but flows back only slowly so that under certain conditions it may be expelled into the antechamber above the shoulder. By extending the capillary grooves in the feed bar and by providing an additional air passage in that face of the bar which is opposite the nib, the air in the cavities of the cam sleeve is enabled to escape so that the ink can flow back rapidly.

The shoulder and the pen-holding ring divide the ink holder into the reservoir proper, of larger volume, and the antechamber at the upper end of the holder, the volume of this antechamber preferably being as small as practicable, as ink which collects in the antechamber might leak from the fountain-pen. The pen-holding ring therefore preferably cooperates with the inner shoulder after the manner of a piston slide because in this form the diameter of the antechamber need not perceptibly exceed the diameter of the ring.

A piston slide, however, involves the drawback that considerable splashing occurs while the nib is being retracted. This tendency is overcome according to my invention by so designing the cam sleeve that it will impart to the feed bar a slight advancing movement before retracting it. During this advancing movement of the feed bar the ink in the air passage is drawn back so that when the retracting movement starts, the air will escape without splashing.

The length and in consequence also the volume of the antechamber are considerably

reduced according to my invention by so designing the reciprocating mechanism that the nib is not completely retracted but projects somewhat from the holder when in retracted position. This arrangement involves the further advantage that the feed bar has a short stroke so that it is possible to advance and retract the nib by less than a full turn. The rotation of the base piece is limited by a check pin fixed in each of the abutting faces of the threaded plug and the base piece. I am thus enabled to space the checks considerably from the axis of the holder so that the force with which the checks are held engaged is less for a given turning movement than with checks arranged nearer the axis. The abutting faces are held against axial displacement so that the pins will properly engage even if projecting only slightly. As the pins are short, the leverage is small and the pins will not work loose even during continuous use.

The feed bar is prevented from sliding back during writing by a short rearwards directed extension of the helical slot which causes the bar to be advanced before it is retracted as described, the pin on the feed bar being reliably held in this extension.

In the drawings affixed to this specification and forming part thereof a fountain-pen embodying my invention is illustrated diagrammatically by way of example.

In the drawings

Fig. 1 is a longitudinal section of the holder with retracted nib,

Fig. 2 is a longitudinal section of the feed bar,

Figs. 3 and 4 are cross-sections of the feed bar on the lines 3—3 and 4—4 in Fig. 2, respectively.

Fig. 5 is a cross-section of the holder on the lines 5—5 in Fig. 1, drawn to a larger scale, and

Fig. 6 is a cross-section on the lines 6—6 in Fig. 1.

Referring to the drawings, A is the nib which is held in the feed bar H by a ring D. G is the casing or holder and B is a shoulder formed at the mouth of the holder and co-operating with the ring D for closing the holder when writing. B′ is another shoulder formed in the holder, and subdividing it into the reservoir F and the antechamber C extending between the shoulders B′ and B. The length of the antechamber C is such that the nib A projects from the holder even when the feed bar H has been completely retracted as shown. This is provided in order to reduce the volume of the antechamber. Instead of a separate ring D on the feed bar H a boss or the like might be formed on the bar.

The shoulder B′ is positioned at the point where the ring D stands when the nib A has been completely retracted. A clearance E is formed between the ring D and this shoulder, which allows ink to pass through but prevents the entrance of air when ink has entered between the ring and the shoulder B′. Above this shoulder the clearance opens into the antechamber C, the diameter of the antechamber being such that ink and air can flow simultaneously in opposite directions between the wall of the antechamber C and the ring D when the nib has been partly advanced.

J is a comparatively wide air passage in the feed bar H at the bottom of which the capillary grooves K are formed. The passage J extends so far below the ring D that an accumulation of ink in the vicinity of the ring is eliminated. Preferably the lower end of the air passage does not extend beyond the front end of the cam sleeve N, when the nib has been completely retracted, and prevents a sudden flow of the ink filling the cavities of the sleeve when the nib has been retracted. On the other hand the capillary grooves K extend far enough to communicate with the cavities of the sleeve when the feed bar has been advanced, in order to expedite the flowing back of the ink in these cavities when retracting the nib, and to utilize the ink from such cavities. In order to enable the air to escape from the cavities of the cam sleeve when retracting the nib, a separate air passage L is arranged on the feed bar opposite the air passage J, this second air passage still extending above the cam sleeve N when the nib has been retracted.

The helical groove M engages a pin Q at the end of the feed bar H. At the upper end of the groove M a short extension M′ is provided, extending in opposite direction and serving to effect the short advance of the feed bar before it is retracted, as above explained. This short extension M′ affords a reliable hold for the advanced feed bar when the pen is being used. The pitch of the helical groove M is such that a partial turn of the handle R suffices for moving the nib A into operative position from the retracted position illustrated.

A threaded plug O surrounding a cork packing ring P is screwed into the lower end of the holder G. S is a shaft formed integral with the cam sleeve N and extending through the threaded plug O and cork ring P. R is a rotatable base piece secured on the shaft S by means of a pin W. An annular groove U is formed in the end face of the base piece R which abuts against the plug O. A pin T in the plug O extends into the groove U and a pin V secured in this groove is arranged to cooperate with pin T in the plug O so as to limit the rotation of the base piece R relative to plug O.

I wish it to be understood that I do not desire to be limited to the exact details of

construction shown and described, for obvious modifications will occur to a person skilled in the art.

I claim:—

1. A fountain pen comprising an inkholder, a feed bar, means for reciprocating said feed bar in said inkholder, a nib at the outer end of said feed bar at one side thereof, a ring holding said nib on said feed bar, said feed bar defining an air channel extending along the side of said feed bar where said nib is secured thereto so as to be covered at its end by said nib, and also defining capillary ink grooves extending along the bottom of said air channel into the vicinity of the point of said nib, said air channel being of such area, and said capillary grooves extending into said inkholder so far as to permit ink to flow downwardly from such passage when said fountain pen is held with the nib up, a shoulder at the end of said inkholder which is adapted to cooperate with said ring on said feed bar to close said inkholder, and a shoulder at the rear of said first-mentioned shoulder which is adapted to cooperate with said ring in the retracted position of said feed bar so as to constitute with said ring an annular space which is so narrow as not to permit air to pass when it is filled with ink.

2. A fountain pen comprising an inkholder, a feed bar, means for reciprocating said feed bar in said inkholder, a nib at the outer end of said feed bar at one side thereof, a ring holding said nib on said feed bar, said feed bar defining an air channel extending along the side of said feed bar where said nib is secured thereto, so as to be covered at its end by said nib, and also defining capillary ink grooves extending along the bottom of said air channel into the vicinity of the point of said nib, said air channel being of such area, and said capillary grooves extending into said inkholder so far as to permit ink to flow downwardly from such passage when said fountain pen is held with the nib up, a shoulder at the end of said inkholder which is adapted to cooperate with said ring on said feed bar to close said inkholder, and a shoulder at the rear of said first-mentioned shoulder which is adapted to cooperate with said ring in the retracted position of said feed bar so as to constitute with said ring an annular space which is so narrow as not to permit air to pass when it is filled with ink, the inside diameter of said inkholder intermediate said shoulders being such that ink and air are able to flow at the same time but in opposite directions in the space intermediate said ring and the inner wall of said inkholder.

3. A fountain pen comprising an inkholder, a feed bar, a cam sleeve in said inkholder adapted to cooperate with the inner end of said feed bar so as to reciprocate it, means for rotating said cam sleeve, a nib at the outer end of said feed bar at one side thereof, a ring holding said nib on said feed bar, said feed bar defining an air channel extending along the side of said feed bar where said nib is secured thereto, so as to be covered at its end by said nib, and also defining capillary ink grooves extending along the bottom of said air channel into the vicinity of the point of said nib at one end and extending at least as far as the front face of said cam sleeve at the other end, in the advanced position of said feed bar, said air channel being of such area, and said capillary grooves extending into said inkholder so far as to permit ink to flow downwardly from such passage when said fountain pen is held with the nib up, a shoulder at the end of said inkholder which is adapted to cooperate with said ring on said feed bar to close said inkholder, and a shoulder at the rear of said first-mentioned shoulder which is adapted to cooperate with said ring in the retracted position of said feed bar so as to constitute with said ring an annular space which is so narrow as not to permit air to pass when it is filled with ink.

4. A fountain pen comprising an inkholder, a feed bar, a cam sleeve in said inkholder adapted to cooperate with the inner end of said feed bar so as to reciprocate it, means for rotating said cam sleeve, a nib at the outer end of said feed bar at one side thereof, a ring holding said nib on said feed bar, said feed bar defining an air channel extending along the side of said feed bar where said nib is secured thereto, so as to be covered at its end by said nib, and also defining capillary ink grooves extending along the bottom of said air channel, said air channel ending at said cam sleeve when said feed bar is in its retracted position, and said capillary ink grooves extending at least as far as the front face of said cam sleeve when said feed bar is in its advanced position, and said feed bar defining a supplementary air passage in the side of said feed bar opposite said first-named channel and extending from the end of said feed bar beyond said cam sleeve when said feed bar is in its retracted position, said air channel being of such area, and said capillary grooves extending into said inkholder so far as to permit ink to flow downwardly from such passage when said fountain pen is held with the nib up, a shoulder at the end of said inkholder which is adapted to cooperate with said ring on said feed bar to close said inkholder, and a shoulder at the rear of said first-mentioned shoulder which is adapted to cooperate with said ring in the retracted position of said feed bar so as to constitute with said ring an annular space which is so narrow as not to permit air to pass when it is filled with ink.

5. A fountain pen comprising an inkholder, a feed bar, means for advancing and retracting said feed bar in said inkholder and for automatically imparting to it a short forward motion preceding its retracting motion, a nib at the outer end of said feed bar at one side thereof, a ring holding said nib on said feed bar, said feed bar defining an air channel extending along the side of said feed bar where said nib is secured thereto, so as to be covered at its end by said nib, and also defining capillary ink grooves extending along the bottom of said air channel into the vicinity of the point of said nib, said air channel being of such area, and said capillary grooves extending into said inkholder so far as to permit ink to flow downwardly from such passage when said fountain pen is held with the nib up, a shoulder at the end of said inkholder which is adapted to cooperate with said ring on said feed bar to close said inkholder, and a shoulder at the rear of said first-mentioned shoulder which is adapted to cooperate with said ring in the retracted position of said feed bar so as to constitute with said ring an annular space which is so narrow as not to permit air to pass when it is filled with ink.

6. A fountain pen comprising an inkholder, a feed bar, a cam sleeve in said inkholder adapted to cooperate with the inner end of said feed bar so as to reciprocate it, means for rotating said cam sleeve, said cam sleeve defining a helical groove and an opposite extension at the outer or forward end of said groove, a nib at the outer end of said feed bar at one side thereof, a ring holding said nib on said feed bar, said feed bar defining an air channel extending along the side of said feed bar where said nib is secured thereto, so as to be covered at its end by said nib, and also defining capillary ink grooves extending along the bottom of said air channel into the vicinity of the point of said nib, said air channel being of such area, and said capillary grooves extending into said inkholder so far as to permit ink to flow downwardly from such passage when said fountain pen is held with the nib up, a shoulder at the end of said inkholder which is adapted to cooperate with said ring on said feed bar to close said inkholder, and a shoulder at the rear of said first-mentioned shoulder which is adapted to cooperate with said ring in the retracted position of said feed bar so as to constitute with said ring an annular space which is so narrow as not to permit air to pass when it is filled with ink.

7. A fountain pen comprising an inkholder, a feed bar, a cam sleeve in said inkholder adapted to cooperate with the inner end of said feed bar, so as to reciprocate it, means for rotating said cam sleeve, checks fixed in the abutting end faces of said holder and said rotating means, a nib at the outer end of said feed bar at one side thereof, a ring holding said nib on said feed bar, said feed bar defining an air channel extending along the side of said feed bar where said nib is secured thereto, so as to be covered at its end by said nib, and also defining capillary ink grooves extending along the bottom of said air channel into the vicinity of the point of said nib, said air channel being of such area, and said capillary grooves extending into said inkholder so far as to permit ink to flow downwardly from such passage when said fountain pen is held with the nib up, a shoulder at the end of said inkholder which is adapted to cooperate with said ring on said feed bar to close said inkholder, and a shoulder at the rear of said first-mentioned shoulder which is adapted to cooperate with said ring in the retracted position of said feed bar so as to constitute with said ring an annular space which is so narrow as not to permit air to pass when it is filled with ink.

In testimony whereof I affix my signature.

THEODOR KOVÁCS.