Oct. 26, 1937. W. R. CUTHBERT 2,096,708

FOUNTAIN PEN

Filed Dec. 2, 1935

Fig. 1.

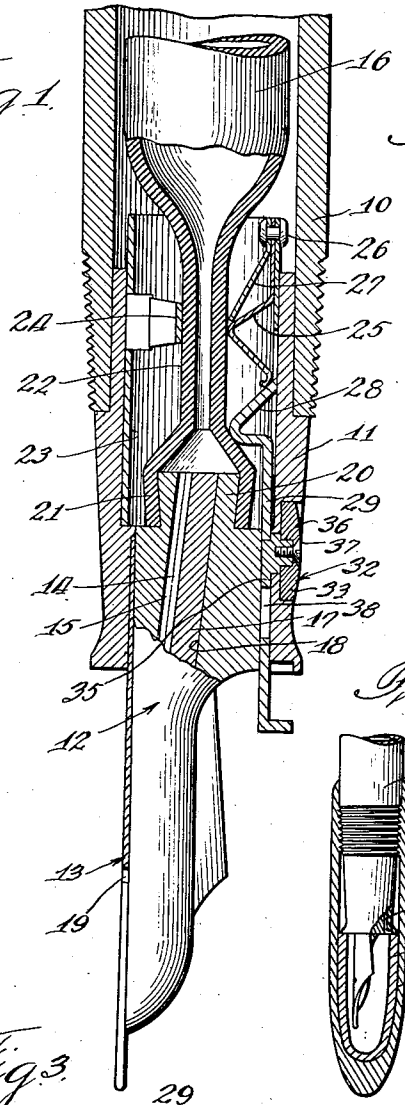


Fig. 2.

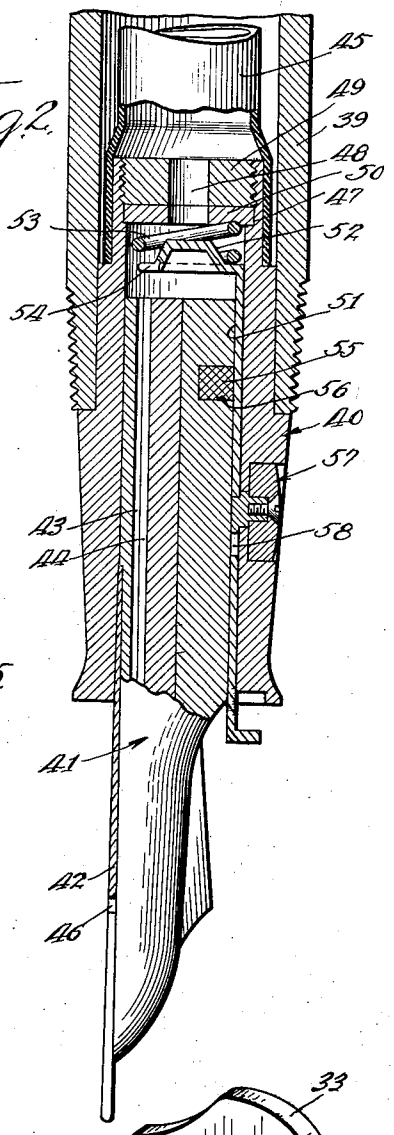


Fig. 5.

Fig. 3.

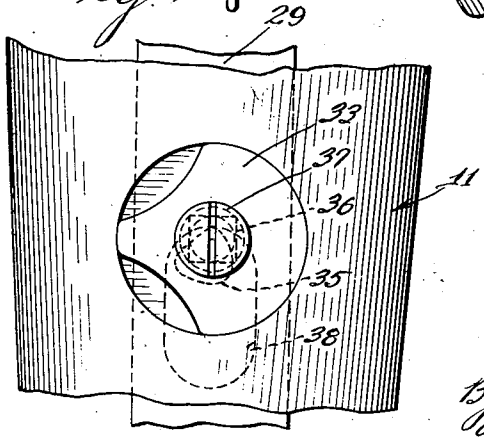
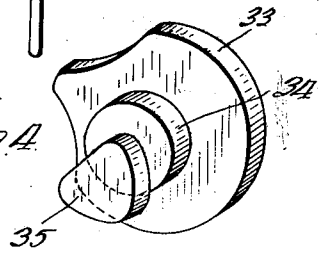


Fig. 4.



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FOUNTAIN PEN

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Application December 2, 1935, Serial No. 52,457

10 Claims. (Cl. 120—48)

This invention relates to a fountain pen and has special reference to a fountain pen having a writing fluid feeding mechanism including means for regulating the flow of the writing fluid to the pen nib thereof when the fountain pen is in condition for use and for sealing the writing fluid within the reservoir when the cap is on the writing point end of the barrel and the fountain pen not in use.

More particularly, this invention relates to a fountain pen including a feed bar in the writing point end of the barrel communicating with a reservoir having means for controlling a flow of a writing fluid from the reservoir to the feed bar comprising an arm slidably disposed adjacent the outer periphery of the feed bar and extending beyond the end of the barrel in writing condition, there being co-operating means in the barrel beyond the inner end of the feed bar to seal the writing fluid in the reservoir against flow to the feed bar by slidable movement of the arm in one direction when the extending portion thereof is engaged by a cap disposed on the writing point end of the barrel with resilient means for moving the arm in the opposite direction and for normally holding the arm in an extended condition when the cap is removed from the writing point end of the barrel.

A regulation of the sealing means or valvular structure controlling the supply of writing fluid from the reservoir to the feed bar is obtained by a limitation of the extended position of the arm by means operable from the outside of the barrel. In the present illustration of the drawing, a cam means is shown for limiting the extended movement of the arm which regulates the valvular opening and thereby the amount of fluid which may pass from the reservoir to the feed bar.

The present construction affords a simple and efficient means for effectively sealing the writing fluid against leakage when the pen cap is in place and the pen not in use. While it is the duty of the cap in most present day constructions to effect a seal of the writing mechanism, such seal is merely effected exteriorly of the feed mechanism with the result that leakage may occur from the reservoir through the feed bar into the cap and about the pen nib. Thereafter, when the cap is removed from the writing point end of the barrel, there is great danger of the writing fluid flowing upon the fingers or clothing of the writer, the writing fluid being forced into a flooded condition by excessive temperatures or by being jostled about in a handbag or by other abnormal conditions. The present invention, of course, contemplates the elimination of the above objections in the provision of a seal within the writing mechanism so that a flow from the reservoir to the feed bar may not be obtained at any time when the cap is in position on the writing point end of the barrel.

It is therefore one of the objects of this invention to provide a fountain pen having a writing fluid feeding mechanism of the character above noted wherein the writing fluid is effectively sealed against flooding the writing point of the pen nib or the feed bar by means within the feeding mechanism operable upon the positioning of the cap on the writing point end of the barrel, an unsealed condition being obtained upon the removal of the cap.

A further object of this invention is to provide a fountain pen having a writing fluid feeding mechanism of the type above noted in which the amount of flow of writing fluid to the pen nib is regulated by means interiorly of the feed mechanism.

It is also an object of this invention to provide a fountain pen having a writing fluid feeding mechanism of the character hereinabove recited which is efficient and simple in operation and comparatively inexpensive to manufacture.

Other objects and advantages will hereinafter be more particularly pointed out and for a more complete understanding of the characteristic features of this invention, reference may now be had to the following description when taken together with the accompanying drawing, in which latter:

Figure 1 is a fragmental enlarged central vertical sectional view of the writing point end of a fountain pen having a writing fluid feeding mechanism embodying the features of the present invention;

Fig. 2 is a view similer to Fig. 1 of a modified form of writing fluid feeding mechanism embodying the features of this invention;

Fig. 3 is an enlarged side elevational view of the regulating means disposed in a fragmental portion of the barrel for controlling the flow of writing fluid to the pen nib;

Fig. 4 is a perspective view of the cam element for limiting the extended movement of the valve arm of the feeding mechanism; and

Fig. 5 is a fragmental view in elevation of the writing point end of the fountain pen incorporating this invention showing a portion thereof in section with the cap in position on the writing point end of the pen nib having operated the valve arm in a direction to close the valve.

Referring now more particularly to Fig. 1 of the drawing, the fountain pen incorporating the features of this invention comprises a barrel 10 having a reduced extension of the feed section 11 engaging the bore of one end thereof, the feed section, in turn, having a feed bar 12 engaging the bore at the outer end of the feed section and extending therebeyond in the usual manner. A pen nib 13 is disposed about one side of the periphery of the feed bar and extends into the feed section a short distance to be held in position therein between the inner bore thereof and the outer periphery of the feed bar by a frictional fit. Hereafter, unless otherwise specified, the feed section may be considered a part of the barrel although made in separate sections for manufacturing expediency.

The feed bar 12 is provided with the usual fissures 14 in the ink duct 15 for communication with an ink reservoir which, in the particular instance shown, is a flexible sack 16, although the invention, as will hereinafter be readily apparent, may be adapted for use on the sac-less type pens or those pens in which the barrel proper acts as the reservoir for the writing fluid. The fissures 14 and ink duct 15 are preferably formed on the outer periphery of a rod 17 which is inserted in a longitudinally extending bore 18 in the feed bar from the inner end thereof to a point adjacent the heart pierce 19 of the pen nib 13. The feed bar has preferably a reduced extension 20 for receiving the end 21 of the flexible sack 16, the sack being provided with a flattened or restricted neck portion 22 between the end of the feed bar and the main body portion thereof.

A sleeve 23 is fixedly mounted within the inner end of the feed section 11 and extends a substantial distance beyond the end of the feed bar 12. The sleeve 23 is provided with a laterally extending seat 24 formed preferably from the material of the sleeve, the seat engaging one side of the restricted neck portion 22 of the flexible ink sack. Diametrically opposed to the seat 24 is a spring finger 25 attached to the innermost end of the sleeve by a rivet or other securing means 26, which rivet likewise holds a leaf spring member 27 in position against a laterally extending portion of the finger 25. The spring finger 25 is operated laterally in a direction toward the seat 24 by an angularly disposed projection 28 of a longitudinally slidable arm 29, the arm being preferably disposed on the outer side of the feed bar. In a normal writing condition, the outer end of the arm 29 extends beyond the outer end of the feed section, or considering the feed section a part of the barrel, beyond the end of the barrel.

Referring for the moment to Fig. 5 of the drawing, a cap 30, having an inner sealing member 31, is threadedly engaged on the end of the barrel 10 for use when the pen is being carried about the person. It will be noted that the inner cap 31 has moved the arm 29 to a position wholly within the end of the barrel or feed section. However, when the cap is removed, the leaf spring 27 bearing against the spring finger 25 acts to move the longitudinally slidable arm 29 in a direction outwardly of the barrel. Conversely, of course, when the cap is screwed on the end of the barrel, the arm is moved inwardly with the angularly disposed projection 28 engaging the end of the spring finger 25 to urge the laterally extending portion thereof in a direction toward the seat 24 to pinch the restricted neck portion and obstruct the passage of writing fluid from the reservoir 16 to the fissures of the feed bar 12.

When the arm 29 is wholly contained within the feed section or the end of the barrel, a fully extended lateral condition of the spring finger 25 is obtained and a seal against passage of fluid from the reservoir is obtained. However, the movement of the arm 29 in an extended condition may be so controlled that any desired amount of flow may be obtained from the reservoir 16 to the feed bar by means of an ink control 32.

The ink control 32 may comprise preferably, as shown more particularly in Figs. 3 and 4, an operating handle portion 33 having a mutilated periphery of any desired character so that it may be readily gripped for movement in a rotatable manner, the operating head 33 having a stud shaft 34 extending from the face thereof with a cam member 35 extending from the stud portion 34. The cam 35 and stud shaft 34 may be formed integrally with a squared extension 36, which latter fits within a similarly squared opening in the operating head to be held in a fixed relation therein by a screw 37. The operating head 33 may be received in a recess in the barrel or feed section of the fountain pen, the recess having a communicating reduced recess for receiving and permitting rotation therein of the stud shaft 34. The cam 35 extends within the bore of the feed section for engagement with a slot 38 of the arm 29.

In Fig. 1 of the drawing, the cam portion 35 is shown in a position such that the fully extended condition of the arm is obtained. However, should it be desired to restrict the flow of ink appreciably, then the cam may be rotated to a position by the rotation of the operating head 33 such that the extended condition of the arm 29 will be shortened which thereby would prevent a full return of the spring finger 25 to a position shown in Fig. 1, but would stop it at an intermediate distance to further restrict the opening in the neck. The extent to which the arm 29 may be operated outwardly by the leaf spring 27 depends, therefore, upon the position of the cam 35 in the groove 38 of the arm 29. In turn, a limitation of the movement outwardly of the arm 29 effects the lateral positioning of the spring finger 25 to effect a restriction of the flow of writing fluid from the reservoir 16 to the feed bar 12.

Referring now more particularly to Fig. 2 of the drawing, the invention is further shown as being embodied in a fountain pen including a barrel 39 for receiving the reduced extension of a feed section 40 at one end thereof, the feed section 40, in turn, receiving a feed bar 41 within the bore at the outer end thereof and the feed bar extending beyond the end of the feed section in the usual manner. A pen nib 42 is disposed on one side of the periphery of the feed bar 41 and is engaged and supported thereon by a frictional fit between the inner bore of the feed section and the outer periphery thereof. The feed bar 41 is provided with the usual ink duct 43 and fissures 44 extending longitudinally thereof and communicating between a reservoir 45 and the underneath side of the pen nib 42 at the heart pierce 46. The reservoir 45 is, in this instance, likewise shown as a flexible sack for fitting snugly a reduced extension 47 of the feed section 40. However, the flexible sack may be omitted if it is desired to employ the construction in the usual sac-less type pen.

In order to effect the regulation of the amount of flow of writing fluid from the reservoir 45 to the pen nib 42 and for sealing the writing fluid within the reservoir when the cap is on the writ-

ing point end of the barrel and the pen nib not in use, the feed section **40** is provided with a restricted opening **48** at its innermost end preferably by means of threading or otherwise securing an apertured washer **49** in engagement with the bore of the feed section. The washer **49** may be formed of the usual plastic material of substantial hardness and rigidity, and, in order to accommodate a sealing action, as will hereinafter be more fully explained, a relatively soft rubber gasket **50** may be disposed on the face of the washer **49**, the gasket having an aperture registering with that of the washer.

An arm **51** is disposed adjacent the feed bar **41** and is slidable longitudinally thereof, the arm in a normal writing condition extending beyond the outer end of the barrel or of the feed section **40** when the cap is not in position thereon. However, when the cap is threaded onto the writing point end of the barrel, the inner sealing member engages the arm **51** as shown more particularly in Fig. 5 and the arm is moved longitudinally with a laterally extending valve portion **52** seating against the relatively soft gasket **50** to seal the writing fluid within the reservoir **45**. When the cap is removed from the writing point end of the barrel, a compression spring **53** operates to move the arm **51** outwardly and thereby to break the seal between the reservoir and the feed bar and permit a flow of writing fluid to the pen nib.

The valve structure **50** may comprise a substantially dish shaped member which may be coextensive and integral with the inner end of the arm **51**. Further, the dished valve portion may be notched at an outer peripheral portion **54** to facilitate the flow of writing fluid therearound, the compression spring lying between the dish shaped valve structure and the gasket **50**. It may be desirable to provide a soft gasket material **55** in a recess **56** in the feed bar **41** for sealing the slidable arm **51** and thus obviating leakage of writing fluid therebetween.

The extended condition of the arm **51** may be limited to effect a regulation of the amount of flow of writing fluid from the reservoir **45** to the feed bar **41** by means of a cam construction **57**, the cam portion of which engages an elongated slot **58** in the arm **51** in the manner previously described with reference to Fig. 1.

While but two embodiments of this invention are herein shown and described, it is to be understood that various modifications thereof may be apparent to those skilled in the art without departing from the spirit and scope of this invention and, therefore, the same is only to be limited by the scope of the prior art and the appended claims.

I claim:

1. In a fountain pen including a feed bar tightly engaging in a fixed position the bore of the writing point end of the barrel and having a passageway in the bar communicating with a reservoir for writing fluid and a cap for detachably enclosing the feed bar and the writing point end, means for controlling the flow of the writing fluid from the reservoir to the feed bar comprising an arm slidably disposed adjacent the outer periphery of the feed bar and extending beyond the end of the barrel in writing condition, a seat fixed against movement in the barrel beyond the inner end of the feed bar and adjacent the fluid reservoir, means co-operating between said arm and said seat to seal the writing fluid in said reservoir against flow to said feed bar by the slidable movement of said arm in one direction when the extending portion thereof is engaged by the cap disposed on the writing point end of the barrel, and resilient means for moving said arm in the opposite direction and for normally holding said arm in an extended condition when the cap is removed from the writing point end of the barrel.

2. In a fountain pen including a feed bar tightly engaging in a fixed position the bore of the writing point end of the barrel and having a passageway in the bar communicating with a reservoir for writing fluid and a cap for detachably enclosing the feed bar and the writing point end, means for controlling the flow of the writing fluid from the reservoir to the feed bar comprising an arm slidably disposed adjacent the outer periphery of the feed bar and extending beyond the end of the barrel in writing condition, a seat fixed against movement in the barrel beyond the inner end of the feed bar and adjacent the fluid reservoir, means movable with said arm for acting on said seat to seal the writing fluid in said reservoir against flow to said feed bar by the slidable movement of said arm in one direction when the extending portion thereof is engaged by the cap disposed on the writing point end of the barrel, and resilient means for moving said arm in the opposite direction and for normally holding said arm in an extended condition when the cap is removed from the writing point end of the barrel.

3. In a fountain pen including a feed bar tightly engaging in a fixed position the bore of the feed section adjacent the writing point end of the barrel thereof and a cap secured to said barrel for detachably enclosing the feed bar and writing point end, the feed bar having fissures communicating with a writing fluid reservoir in the barrel, means for controlling the flow of the writing fluid from the reservoir to the feed bar comprising an arm slidably disposed adjacent the outer periphery of the feed bar and extending beyond the outer end of the feed section in writing condition, a seat fixed against movement in the feed section beyond the inner end of the feed bar and adjacent the fluid reservoir, means movable with said arm for acting on said seat to seal the writing fluid in said reservoir against flow to the feed bar by the slidable movement of said arm in one direction when the extending portion thereof is engaged by the cap disposed on the writing point end of the barrel, and resilient means for moving said arm in the opposite direction and for normally holding said arm in an extended condition when the cap is removed from the writing point end of the barrel.

4. In a fountain pen including a feed bar tightly engaging in a fixed position the bore of the feed section adjacent the writing point end of the barrel thereof and a cap secured to said barrel for detachably enclosing the feed bar and writing point end, the feed bar having fissures communicating with a writing fluid reservoir in the barrel, means for controlling the flow of the writing fluid from the reservoir to the feed bar comprising an arm slidably disposed adjacent the outer periphery of the feed bar and extending beyond the outer end of the feed section in writing condition, the feed section having a restricted opening at its inner end adjacent the fluid reservoir, a valve extending from said arm and movable therewith for sealing said opening to prevent flow of writing fluid from the reservoir to the feed bar by the slidable movement of said arm in one direction when the extending portion thereof is engaged by the cap disposed on the

writing point end of the barrel, and resilient means for moving said arm in the opposite direction and for normally holding said arm in an extended condition when the cap is removed from the writing point end of the barrel.

5. In a fountain pen including a feed bar tightly engaging in a fixed position the bore of the feed section adjacent the writing point end of the barrel thereof and a cap secured to said barrel for detachably enclosing the feed bar and writing point end, the feed bar having fissures communicating with a writing fluid reservoir in the barrel, means for controlling the flow of the writing fluid from the reservoir to the feed bar comprising an arm formed of sheet metal and being slidably disposed adjacent the outer periphery of the feed bar and extending beyond the outer end of the feed section in writing condition, the feed section having a restricted opening at its inner end adjacent the fluid reservoir, a valve formed integrally with said arm and movable therewith for sealing said opening to prevent flow of writing fluid from the reservoir to the feed bar by the slidable movement of said arm in one direction when the extending portion thereof is engaged by the cap disposed on the writing point end of the barrel, and resilient means for moving said arm in the opposite direction and for normally holding said arm in an extended condition when the cap is removed from the writing point end of the barrel.

6. In a fountain pen including a flexible sack for writing fluid communicating with a feed bar in the writing point end of the barrel and a cap for detachably enclosing the feed bar and the writing point end, means for controlling the flow of the writing fluid from the flexible sack to the feed bar comprising an arm slidably extending beyond the end of the barrel in writing condition, a seat fixed against movement in the barrel on one side of said flexible sack, means movable with said arm on the other side of said flexible sack for compressing said sack against said seat to seal the writing fluid in said reservoir against flow to said feed bar by the slidable movement of said arm in one direction when the extending portion thereof is engaged by the cap disposed on the writing point end of the barrel, and resilient means for moving said arm in the opposite direction and for normally holding said arm in an extended condition when the cap is removed from the writing point end of the barrel.

7. In a fountain pen including a flexible sack for writing fluid communicating with a feed bar in the writing point end of the barrel and a cap for detachably enclosing the feed bar and the writing point end, means for controlling the flow of the writing fluid from the flexible sack to the feed bar comprising an arm slidably extending beyond the end of the barrel in writing condition, a seat fixed against movement in the barrel on one side of said flexible sack, a spring finger on the other side of said flexible sack, said arm engaging said finger for compressing said sack against said seat to seal the writing fluid in said reservoir against flow to said feed bar by the slidable movement of said arm in one direction when the extending portion thereof is engaged by the cap disposed on the writing point end of the barrel, and resilient means for moving said arm in the opposite direction and for normally holding said arm in an extended condition when the cap is removed from the writing point end of the barrel.

8. In a fountain pen including a feed bar in the writing point end of the barrel communicating with a reservoir for writing fluid and a cap for detachably enclosing the feed bar and writing point end, means for regulating the flow of writing fluid between the reservoir and the feed bar comprising a valve therebetween, an arm slidably extending from said valve beyond the end of the barrel in writing condition, the cap acting in one direction on the extending portion of said arm to close the valve when disposed on the writing point end of the barrel, resilient means for moving said arm in the opposite direction and for normally holding said arm in an extended condition when the cap is removed from the writing point end of the barrel, and means for limiting the extended movement of said arm to regulate the opening of said valve.

9. In a fountain pen including a feed bar in the writing point end of the barrel communicating with a reservoir for writing fluid and a cap for detachably enclosing the feed bar and the writing point end, means for controlling the flow of the writing fluid from the reservoir to the feed bar comprising an arm slidably disposed adjacent the outer periphery of the feed bar and extending beyond the end of the barrel in writing condition, co-operating means in said barrel beyond the inner end of said feed bar to seal the writing fluid in said reservoir against flow to said feed bar by the slidable movement of said arm in one direction when the extending portion thereof is engaged by the cap disposed on the writing point end of the barrel, resilient means for moving said arm in the opposite direction and for normally holding said arm in an extended condition when the cap is removed from the writing point end of the barrel, and means for limiting the extended condition of said arm.

10. In a fountain pen including a feed bar in the writing point end of the barrel communicating with a reservoir for writing fluid and a cap for detachably enclosing the feed bar and writing point end, means for regulating the flow of writing fluid between the reservoir and the feed bar comprising a valve therebetween, an arm slidably extending from said valve beyond the end of the barrel in writing condition, the cap acting in one direction on the extending portion of said arm to close the valve when disposed on the writing point end of the barrel, resilient means for moving said arm in the opposite direction and for normally holding said arm in an extended condition when the cap is removed from the writing point end of the barrel, said arm having an elongated slot, and cam means on said barrel for engaging said slot for predetermining the extended position of said arm and thereby to regulate the opening of said valve.

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