W. L. CHAPMAN.

FOUNTAIN PEN.

APPLICATION FILED MAY 5, 1914.

1,246,232. Patented Nov. 13, 1917.

Fig. 1.

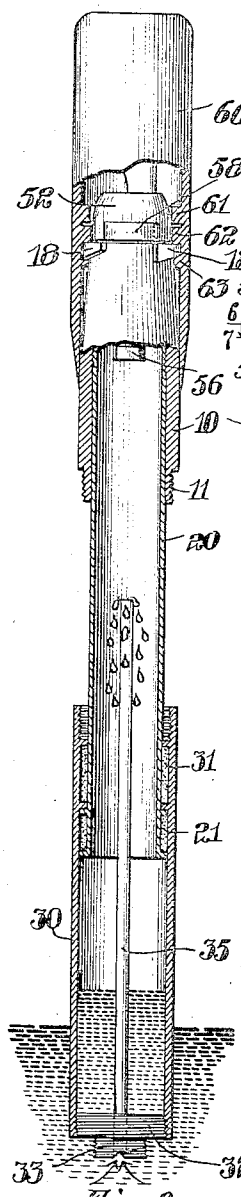


Fig. 2.

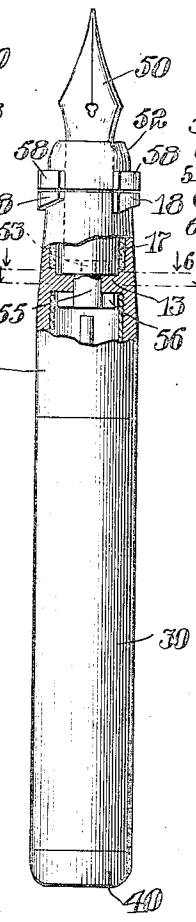


Fig. 3.

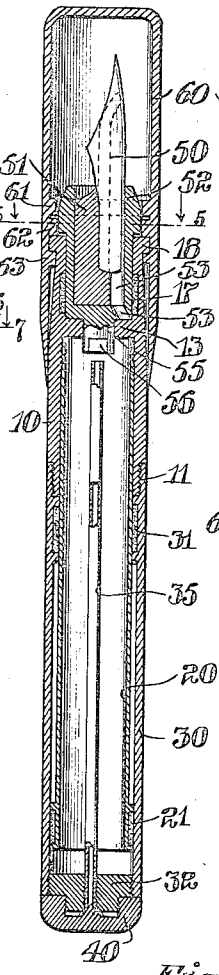


Fig. 4.

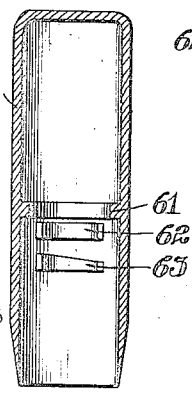


Fig. 5.

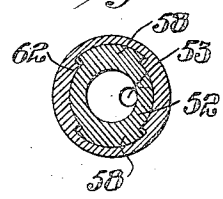


Fig. 9.

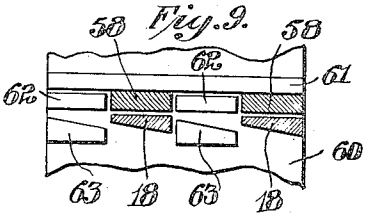


Fig. 2a.

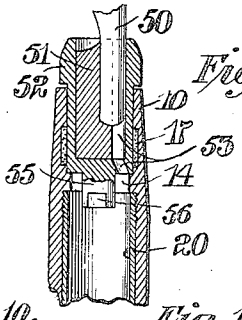


Fig. 6.

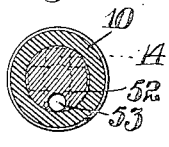


Fig. 7.

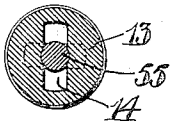


Fig. 8.

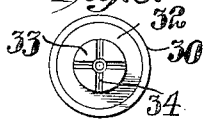


Fig. 10.

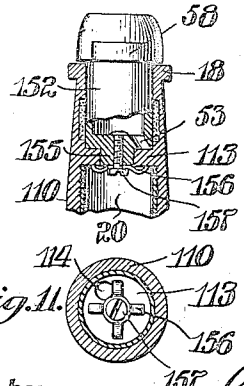
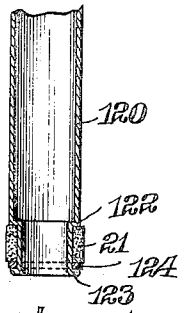


Fig. 11.

Fig. 12.



Attest:

A. Pschierer

by

Inventor:

William L. Chapman

by Wesley Mooney Atty

UNITED STATES PATENT OFFICE.

WILLIAM L. CHAPMAN, OF BROOKLYN, NEW YORK.

FOUNTAIN-PEN.

1,246,232. Specification of Letters Patent. Patented Nov. 13, 1917.

Application filed May 5, 1914. Serial No. 836,399.

To all whom it may concern:

Be it known that I, WILLIAM L. CHAPMAN, a resident of the borough of Brooklyn, in the city of New York, State of New York, have invented certain new and useful Improvements in Fountain-Pens, of which the following is a specification accompanied by drawings.

The invention provides improved means for filling the pen without requiring separate filling appliances, and an improved and very simple, reliable and efficient construction of pen that can be filled from the rear end by dipping the end into an ink-well or other body of ink, and improved means for opening and closing communication between the reservoir and the pen proper or the exterior of the pen, so that the same may be opened for writing and closed for filling or for insuring against the pen leaking in the pocket or elsewhere.

More particularly, in its most complete forms, the invention comprises a pen having improved construction of the extensible reservoir within which partial vacuum can be produced by extending it, cap-actuated means for closing the ink outlet at the forward end of the pen to facilitate the production of such partial vacuum and to prevent accidental leakage, an inlet for ink through the rear end of the reservoir with a combined filling and air-expelling tube rising from the inlet when the rear end is downward to a point above the normal supply of ink for which the reservoir is designed, and through which tube, when the reservoir is compressed or contracted, the air may escape, and a cap for covering and closing the ink inlet at the rear end of the pen.

It will be seen that some combinations and features of the invention may be used without all the others.

In the accompanying drawings,

Figure 1 is a view, partly in longitudinal section, of a fountain pen embodying the invention as seen in the act of being filled, and, therefore, without the rear-end cap;

Fig. 2 is a view of the same pen, partly in central section, showing the parts in writing position with the protective front cap removed;

Fig. 2ª is a partial section of the pen in the same position taken at right angles to Fig. 2;

Fig. 3 is a longitudinal section of the same with the protective cap applied and secured, as in Fig. 1, and the ink outlet at the front closed;

Fig. 4 is a longitudinal cross-section of the protective cap at right angles to Fig. 3;

Fig. 5 is a cross-section of Fig. 3 on the plane 5—5, omitting the pen and securing plug 51;

Fig. 6 is a cross-section of Fig. 2 on the plane 6—6;

Fig. 7 is a cross-section of Fig. 2 on the plane 7—7;

Fig. 8 is a view of the rear end of the pen with the rear-end cap removed;

Fig. 9 is a diagram of part of the interior of the protective cap developed or unfolded into a flat surface, as though slitted lengthwise on one side and opened out flat, the parts shown in section being the coöperating members of the other parts, as explained;

Fig. 10 is a view, partly in central section, of another form of the front-end construction of the reservoir;

Fig. 11 is a view of the same looking forward inside the reservoir, the reservoir walls being in cross-section;

Fig. 12 shows in section a detail of construction of certain packing for the pen.

In the drawings, the pen barrel forms a telescoping reservoir, by the extension and compression of which the ink is drawn in and the air is expelled through the rear end of the reservoir during the filling operation.

Preferably the forward member of the reservoir is formed of an outer shell 10 of hard rubber, within which is screwed or secured the thin metal tube 20, upon which the rear outer shell 30 of the reservoir slides and telescopes. The tube 20 is preferably screw-threaded at its forward end, as shown, into the front shell 10. The rear end of this tube 20 is provided with packing, for example cork, between two collars, so as to slide and be ink-tight within the rear shell 30 of the rear member of the reservoir. The shell 30 is also provided with packing 31 between flanges or collars, as shown, but this packing need not be ink-tight upon the tube 20, as I prefer to allow air to enter and escape to and from the small annular space between the shell 30 and tube 20. The shells 10 and 30 are screw-threaded together, as at 11, so that when the reservoir is in its compressed or closed position its members will be tightly screwed together and present a smooth external appearance, as in Fig. 2,

The rear shell 30 is closed at its rear end, preferably by the screwed-in centrally-perforated head 32, which has a screw-threaded projection 33, on which screws the rear-end cap 40 for closing the rear end of the filling tube. The filling tube 35 is a combined filling and air-expelling tube, by means of which ink is trapped in the reservoir during filling. This tube is fixed in the head 32 and is open at each end. The forward end extends almost to the extreme front end of the reservoir when the reservoir is closed or compressed, as in Figs. 2 and 3. Preferably the projecting end 33 at the rear of the pen is radially grooved or channeled, as at 34 in Fig. 8, to permit the ready access of ink to the mouth of the tube 35, even when the rear end of the pen is pressed down upon a flat surface during filling.

The shell 10 of the front member of the extensible reservoir has a transverse wall 13, forming the front end wall of the reservoir, and provided with an oblong opening 14, best seen in Fig. 7, which serves the double purpose of affording the front outlet or passageway for the ink to pass toward the pen and a means of receiving, seating and securing the rotary pen-holding members which are rotatable to form a valve for closing the passage or opening 14. The forward end of the shell or member 10 is bored out to receive these pen-holding members, and is provided with packing 17 for preventing leakage of ink around them, while permitting them to rotate and act as a valve. Also, the shell or member 10 is provided with two ears or screw teeth 18 having inclined rear faces, as shown, by which the protective cap 60 is secured.

The pen proper 50 is secured by a pen-holding plug 51 in a pen-holding cup and rotary member 52, which also forms the rotary valve, as will be explained. The plug 51 and member 52 have a duct or passageway 53 which, as will be clear from the cross-sectional Figs. 6 and 7, can be turned into or out of registration with the rectangular opening or duct 14 in the wall 13, thereby acting as a valve to open or close communication between the reservoir and the pen, the ducts communicating in the writing position. The pen-holding member 52, at its lower end, has a round stud or projection 55, which extends through the opening 14 and the transverse end wall 13 of the reservoir and is enlarged beneath by the lateral ears or projections 56 at either side. These, as indicated by the dotted lines in Figs. 6 and 7, are of such size as to just pass through the opening 14 in assembling the parts, and then, being turned relative thereto, they serve to lock the pen-holding member to the barrel of the pen and yet permit rotation through nearly a half turn without unlocking it. The location of the ears 56 is such that they are so locked when in the writing position with the cap removed and preferably also when the valve is turned and closed and the pen is in the filling and carrying position with the protective cap on, but this latter is not essential. This combined pen-holding member and rotary valve 52 is further provided with ears or teeth 58 for engaging and turning it by means of the cap, in the manner presently explained.

The protective cap 60 is provided with an internal annular rib 61, forming a stop for endwise engagement on the teeth 58 of the rotary valve, and two pairs of interior teeth 62, 63. The teeth 63 are screw teeth inclined on their upper face, as shown, so as to coöperate with the screw teeth 18 of the shell or barrel, and they are of such size that in thrusting the cap on longitudinally they can pass by, between and beyond the teeth 58 and 18, and then, by the turning of the cap preferably somewhat less than a quarter turn, they engage with the screw teeth 18 and draw the cap tight endwise on the barrel by means of the inclined coöperating faces. The longitudinal movement of the cap during this screw action is arrested and limited by the rib or stop 61, which bears down on the pen-holding member 52 (see diagram Fig. 9), preferably against the projecting teeth 58 thereof, thus pressing the rotary valve tightly down on its seat on the transverse wall 13 and increasing the safety against leakage.

In putting on the cap, the teeth 62 enter between the teeth 58 of the combined pen-holding member and rotary valve member 52, and they are of size to approximately fit between and engage them. When, therefore, the cap is turned and screwed tightly in place, the teeth 58 are turned by the teeth 62, causing the rotation of the pen-holding member or rotary valve, so that the mouth of duct 53 is closed against the wall 13, as shown in Fig. 3. The cap 60 can be placed on the rear end of the pen and held thereon by friction when writing, as is usual.

In Fig. 9, the arrangement and coöperation of the parts just described are shown diagrammatically, as though the cap were cut open lengthwise and flattened out on a plane. The parts are shown at the position when the cap has been pushed on lengthwise but not yet turned, or, in being taken off, has been turned ready to be pulled off lengthwise.

In Figs. 10 and 11, another form of means for retaining the combined pen-holding member and rotary valve is shown. The forward shell 110 of the reservoir fits and receives the combined pen-holding member and rotary valve 152, the rear end of which latter has a short post or projection 155 projecting through and turning in the transverse

end wall 113 of the reservoir. The parts are retained together by means of a small four-armed spring 156, which is screwed to the post 155 by a small screw 157, the front end of which is preferably also upset to rivet it in place, as shown in Fig. 10. The four arms of the spring press upward against the rear face of the wall 113, holding the rotary member or valve in place against the wall 113.

In Fig. 11, the ink opening or duct through the wall 113 is shown at 114, and in Fig. 10 the duct or opening 53 in the valve or pen-holding member 152 is shown closed against the wall 113, as when carrying the pen or ready for filling the reservoir. The exterior details and means by which the rotary member or valve 152 is turned to close or open the ink ducts may be the same as already described.

Fig. 12 shows another form of packing for the rear end of the sliding reservoir tube 120 of thin metal, corresponding to the tube 20 in Fig. 1. The tube 120 has a shoulder 122 where it is slightly reduced in diameter, and the packing 21 is received against this shoulder. The lower flange 123 is not formed until after the packing is in place. After the packing 21 is put on, a collar 124 is placed against it as shown, and then the flange 123 is formed by enlarging and turning over the end of the tube by a suitable tool to secure the collar 124 against the packing 121.

A great many other changes and variations may be made in the details of the parts, as will be clear to those skilled in the art, without materially altering their co-operation.

In assembling the pen in the form shown in Figs. 1 to 8, the rotary pen-holding member or valve 52 is put in place in the shell 10 and the ears or projections 56 turned to lock the parts together and the teeth 58 and 18 left in alinement as in Fig. 2. The outer rear shell 30 is put onto the sliding tube 20 from the front end of the latter, and the tube 20 then screwed or secured in place in the forward outer shell 10. The filling tube 35 is secured in the head 32, and the latter then screwed or secured in the rear end of the shell 30.

In filling the pen, the cap 60 is put on and turned and the ink duct 53 closed, as in Fig. 3. This may be performed automatically and unconsciously by putting the protective cap 60 on the pen. In putting on the cap, the teeth 63 pass beneath the teeth 18, and the teeth 62 enter between the teeth 58. Then the cap is turned to lock it, and thereby the teeth 58 turned, thus turning the valve 52 to the position shown in Fig. 3, in which the rear end of the ink duct 53 rests and is pressed against the solid portion of the wall 13, closing the ink duct and all communication from the front end of the reservoir. The rear end cap 40 is then taken off and the rear shell 30 is then unscrewed at the screw-threads 11, so as to allow the reservoir to be extended, and then the rear end of the pen is held downward and dipped in an ink-well or body of ink, and the reservoir is extended, causing a partial vacuum within it and drawing in the ink through the filling tube 53. Next, the reservoir is slowly compressed or shut up, the excess air within it escaping downward through the filling tube 35, and the ink remaining trapped in the rear end of the reservoir around the filling tube. Usually a second extension and compression of the reservoir in the same way will give the maximum supply of ink, and this will be indicated at the end of the compression stroke by no air, and ink only, escaping from the filling tube. Then, still holding the pen point-up, the rear shell 30 is screwed tightly onto the forward shell 10 by means of the screw-threads 11; ink wiped from the rear end of the pen, and the cap 40 screwed on.

To open the ink duct at the front end of the pen before writing, it is only necessary to turn and draw off the protective cap 60, leaving the teeth 18 and 58 in line, Fig. 2, and thereby, as clearly seen by the cross-sections in Figs. 6 and 7, bringing the ducts or openings 53 and 14 in line, to allow ink to pass to the pen proper.

It will be seen that the pen has a very simple form of telescopic or extensible and compressible reservoir, having a fore portion and a rear portion sliding relative to each other; the rear portion having the ink-filling and air-expelling tube opening through its rear end, and the front portion having means for shutting off the duct leading to the pen proper, which facilitates the production of the partial vacuum within the reservoir during the filling operation, and also prevents leakage. The pen has an ink-filling opening and filling tube operating from the rear end without endangering injury to the pen point and without necessitating any piston and trapping the ink without any check valves.

It will be seen that the rotary member forms a rotary valve for controlling the communication between the reservoir and the exterior of the pen at the forward end, and that, when the cap 60 is screwed tightly onto the shell or valve, it not only closes the valve, but also presses the rotary member against the reservoir wall 13, thus pressing the valve tightly against its seat.

It will be understood that the invention is susceptible of considerable variation in the details of the various parts shown and described, without materially affecting the principles of operation, and the minor details shown and described have not been intended as limiting the invention.

I claim and desire to secure the following:

1. In a fountain pen, a barrel having a perforate end wall affording passage for ink, a rotary member having an ink duct therein and seated endwise against said perforate wall and forming a rotary valve for controlling the passage of ink through the said wall and said duct, a cap, said cap and barrel having coöperating means for securing the cap to the barrel by relative turning of cap and barrel, said means causing also an endwise drawing of the cap in respect to the barrel, said cap and rotary member having coöperating means for turning said rotary member with the cap to actuate said valve, and means for engaging and pressing said rotary member endwise by the said endwise drawing of the cap in direction to press the valve against its seat.

2. In a fountain pen, a barrel having a perforate end wall affording passages for ink, a rotary member having an ink duct therein and seated endwise against said perforate wall and forming a rotary valve for controlling the passage of ink through the said wall and said duct, a cap, said cap and barrel having coöperating wedges for securing the cap to the barrel by relative turning of cap and barrel, said means causing also an endwise drawing of the cap in respect to the barrel, said cap and rotary member having coöperating means for turning said rotary member with the cap to actuate said valve, and a stop on the cap for engaging and pressing said rotary member endwise by the said endwise drawing of the cap in direction to press the valve against its seat.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses, this 4th day of May, 1914.

WILLIAM L. CHAPMAN.

Witnesses:

WM. SCHAEFER,

A. PSCHIERER.