June 7, 1938. S. M. SAGER 2,119,796

FOUNTAIN PEN

Filed July 10, 1937

Fig. 1.

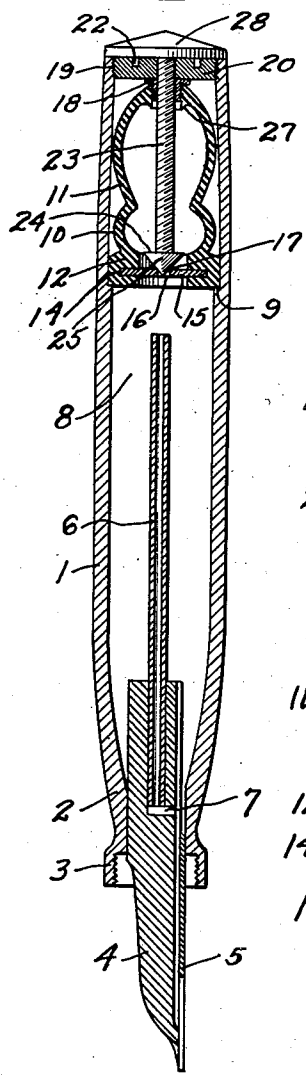


Fig. 2.

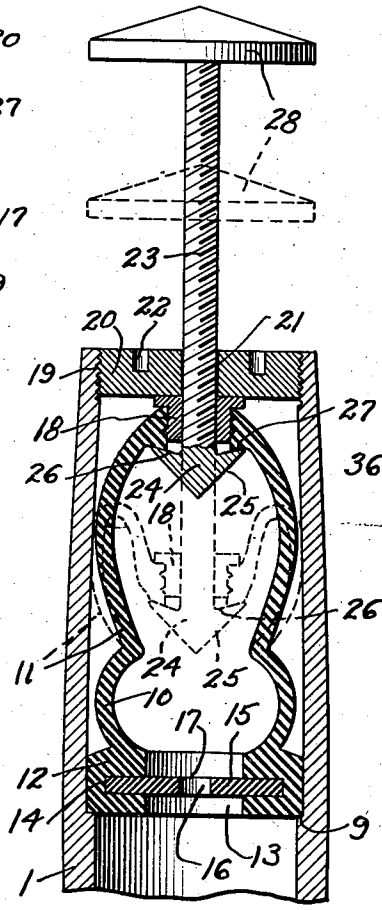
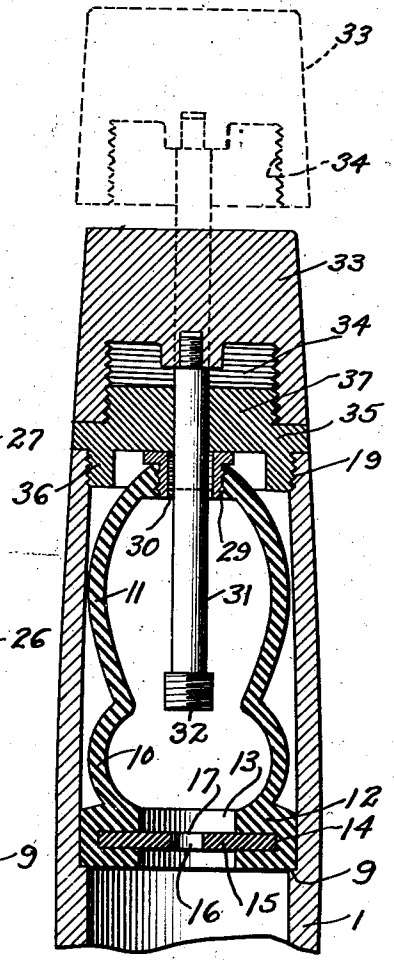


Fig. 3.



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FOUNTAIN PEN

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20 Claims. (Cl. 120—47)

The present invention relates to an improved type of fountain pen and more particularly to a fountain pen having a filling unit engaged in one end of the fountain pen barrel adjacent the inner end of the ink intake tube, said filling unit including a resilient rubber-like bulbous structure collapsible by means of a plunger or operating stem which normally is adapted to be telescoped or disposed axially within the bulbous structure to conserve space, thereby affording an arrangement for providing additional ink capacity in the ink chamber of the fountain pen barrel.

It is an object of this invention to provide a fountain pen with an improved filling unit engaged within one end of the fountain pen barrel and which is actuatable by means of a plunger which normally projects downwardly into a bulbous collapsible filler means but which may be easily moved outwardly into a position to permit reciprocation thereof to actuate the bulbous means to cause filling of the fountain pen barrel.

Another object of the invention is the provision of a fountain pen having a filling unit engaged in one end of the foutain pen barrel, said filling unit consisting of a bulbous structure having associated therewith an operating plunger which normally projects downwardly into one end of the bulbous structure and which may be moved outwardly through the end of the bulbous structure leaving the major portion of the plunger projecting from the end of the fountain pen barrel to facilitate operation of the bulbous structure to cause filling of the fountain pen.

It is also an object of this invention to provide a fountain pen with a filling unit in one end of the fountain pen barrel, said unit having an operating plunger which normally is axially disposed within the filling unit to provide a construction wherein the capacity of the ink chamber of the fountain pen barrel may be increased or wherein the overall length of the fountain pen may be decreased without decreasing the capacity of the ink chamber.

It is an important object of this invention to provide an improved type of fountain pen including a barrel having an ink guard formed on one end thereof through which a feed bar and pen point project for engagement in a section forming part of the barrel, said feed bar having engaged therein one end of an ink intake tube, the other end of which is positioned adjacent an improved type of filler unit engaged in the opposite end of the barrel and including an open collapsible bulbous structure operable by means of a plunger which normally projects axially into the bulbous structure and which is adapted to be moved into an outer operating position projecting from the end of the barrel to seal one end of and actuate the bulbous structure to cause the ink chamber of the fountain pen to be filled with ink.

Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawing.

The invention (in preferred forms) is illustrated in the drawing and hereinafter more fully described.

On the drawing:

Figure 1 is a central longitudinal section of an improved fountain pen embodying the principles of this invention and clearly illustrating an improved filler unit engaged in one end of the fountain pen barrel showing the plunger mechanism in closed normal position with the plunger head forming a finished closure for one end of the fountain pen barrel; said fountain pen being illustrated with the fountain pen cap omitted.

Figure 2 is an enlarged fragmentary longitudinal sectional view of the fountain pen filler unit engaged in one end of the fountain pen barrel and illustrating in full lines the outermost operating position of the plunger mechanism and showing in dotted lines the operation of the plunger mechanism and the resultant collapse of the bulbous filling structure.

Figure 3 illustrates an enlarged fragmentary longitudinal section through one end of a modified form of a fountain pen including a modified form of filling unit which has a plunger mechanism, the plunger stem of which normally projects into the bulbous structure permitting the plunger head or cap to engage one end of the fountain pen barrel, said figure furthermore illustrating, in dotted lines, the outermost position of the plunger mechanism ready for operation of the bulbous filling structure.

As shown on the drawing:

In the illustration of the improved fountain pen shown in Figure 1, the fountain pen cap has been omitted. The reference numeral 1 indicates a fountain pen barrel which is open at both ends. Integrally forming a part of one end of the fountain pen barrel is a fountain pen section 2 having integrally formed on the outer end thereof an ink guard 3. Projecting through the ink guard and into the fountain pen section 2 is a feed bar 4 and a pen point 5. The inner end of the feed bar 4 is provided with a recess for

receiving one end of an ink intake and air tube 6. The end of the ink intake tube 6 seating in the feed bar 4 communicates with a radially directed passage 7, the outer end of which communicates with the ink feed ducts or grooves provided in the feed bar 4. The intake tube 6 projects into the ink chamber 8 of the fountain pen barrel to within a short distance of an improved fountain pen filling unit which is engaged in the end of the fountain pen barrel opposite the ink guard end.

Formed in the barrel 1 is a shoulder 9 against which the inner end of the filler unit is seated. The filling unit comprises a double bulb-like rubber bellows open at both ends and consisting of a lower or small bulb section 10, open at both ends, and a large upper bulb section 11 integrally formed on one end of the bulb section 10. Integrally formed on the small bulb section 10 is a base 12 constructed of rubber or other suitable material with the bottom of the base seated against the shoulder 9 within the ink barrel 1. The base of the filler unit is provided with an axial opening 13 and with an inner groove 14. Seated in the groove 14 of the base 12, to expand the same into a tight seal with the interior of the barrel 1, is a closure disc or plate 15 constructed of hard rubber or other suitable material and having a center aperture or opening 16 providing a valve seat at 17. Molded or otherwise secured in the outer end of the large bulb section 11 is a sleeve or bushing 18, the interior of which is threaded.

The end of the barrel 1, in which the filling unit is engaged, is interiorly threaded at 19 for the reception of an exteriorly threaded enclosure disc or plug 20 which is centrally passaged at 21 and which is also provided with a plurality of recesses or pockets 22 in the outer surface thereof to facilitate engagement therewith of a suitable tool for securing the closure plug 20 in position. Movably projecting through the passage 21 in the closure plug 20 is an exteriorly threaded plunger stem 23 which threads downwardly through the threaded opening in the bushing 18 and has a double valve head 24 formed or secured on the inner end thereof within the multiple bulb bellows. The double valve head 24 is provided with a lower valve surface 25 and a conical upper valve surface 26. The lower valve surface 25 is adapted to seat against the valve seat 17 of the disc 15 when the plunger stem is in its normal closed position, as illustrated in Figure 1, to cause the valve head 24 to close the aperture 16 in the disc 15. When the threaded valve stem 23 is threaded outwardly through the interiorly threaded bushing 18 into the full line position of Figure 2, the outer valve surface 26 of the valve head 24 is moved into an airtight fit with a valve seat 27 formed on the interior of the large bulb section 11 adjacent the bushing 18, as clearly illustrated in Figure 1. It will thus be noted that when the valve head 24 of the plunger mechanism is in either its innermost or outermost position that a tight seal is effected either with the valve seat 17 of the disc 15 or with the valve seat 27 of the bulb section 11. Secured on the outer end of the threaded plunger stem 23 is a plunger actuating knob or head 28 adapted to seat against the outer surface of the closure plug 20 and against the outer end of the ink barrel 1 when the plunger mechanism is in its closed normal position, as illustrated in Figure 1. The plunger actuating head 28 may be of any selected shape or design to furnish a finished end for the ink barrel 1.

Normally, the plunger mechanism of the filling unit is threaded inwardly into the position illustrated in Figure 1 projecting axially through the double bulb bellows with the plunger valve head 24 having the valve surface 25 thereof seating against the valve seat 17 of the disc 15, thereby shutting off communication between the ink chamber 8 and the interior of the double bulb bellows. When it is desired to operate the filling mechanism for the purpose of filling the chamber 8 with ink, it is only necessary to rotate the plunger operating head 28 to cause the plunger stem 23 to be threaded outwardly through the bushing 18 from the position illustrated in Figure 1 into the full line position illustrated in Figure 2 until the valve surface 26 of the valve head 24 seats against the valve seat 27 provided in the bulb section 11. With the plunger stem 23 in its outermost position as shown in Figure 2, the feed bar 4 and pen point 5 are dipped into a supply of ink, and the plunger stem 23 is reciprocated with the plunger stem 23 slidably moving through the closure plug 20. Reciprocation of the plunger stem 23 causes the outer end of the large bulb section 11 to be alternately moved from the full line position of Figure 2 into the dotted line position thereby causing ink to be drawn from the ink supply upwardly through the feed bar 4 through the intake tube 6 to be discharged into the ink chamber 8 of the fountain pen barrel. Operation of the filling unit may be continued until the fountain pen barrel is filled with a desired supply of ink.

After a filling operation of the fountain pen, it is only necessary to thread the valve stem 23 downwardly through the bushing 18, from the full line position of Figure 2, to the full line position of Figure 1, thereby telescoping the plunger mechanism into the multiple bulbous bellows with the plunger actuating head 28 seated against the outer end of the fountain pen barrel 1 to provide a finished construction. The telescoping arrangement of the plunger stem, into the bulbous bellows, conserves space and permits the length of the main body of the fountain pen to be shortened without any sacrifice of the ink capacity of the fountain pen. The telescoping arrangement of the filling unit mechanism also obviates the necessity of providing a closure cap at the end of the barrel opposite the ink guard 3.

Referring to Figure 3, a modified form of filling unit is disclosed for association with one end of a fountain pen barrel 1. In the modified construction, a multiple or double bulb structure similar to that illustrated in Figures 1 and 2 is disclosed, and like parts are designated by corresponding reference numerals. Molded or otherwise rigidly secured in the outer end of the large bulb section 11 is a bushing 29 which is internally threaded at 30. Slidably projecting through the bushing 29 is a smooth plunger stem 31 having formed or rigidly secured on the inner end thereof an enlarged exteriorly threaded head 32, which, when the plunger stem 31 is pulled outwardly and is rotated, is adapted to cause the threaded head 32 to thread into locking engagement with the interiorly threaded surface 30 of the bushing 29 to produce alternate collapsing and expanding of the double bulbous structure, when the plunger mechanism is operated to cause filling of the fountain pen. Secured on the outer end of the plunger stem 31 is an operating head or cap 33 formed with an interiorly threaded

opening 34 in the inner end thereof. The plunger stem 31 also slidably projects through a closure plug or bushing 35 which is formed with an exteriorly threaded shank 36 which threads into the interiorly threaded portion 19 of the ink barrel 1 to hold the closure plug or bushing 35 seated against the end of the barrel 1. An exteriorly threaded collar or neck 37 is integrally formed on the outer side of the closure plug 35 and is so positioned that the interiorly threaded recess 34 of the plunger actuating head or cap 33 is adapted to be threaded downwardly thereon to hold the plunger mechanism in closed position with the plunger stem released from the bushing 29 and telescoped downwardly into the double bulbous bellows forming part of the filling unit. To fill the fountain pen, it is only necessary to unthread the plunger cap 33 from the collar 37 and thread the plunger head 32 into the interiorly threaded bushing 29. The pen point end of the fountain pen is then engaged in a supply of ink, and the plunger stem is reciprocated causing operation of the double bulbous structure to cause ink to be drawn into the fountain pen barrel through the intake tube 6 to fill the ink chamber 8 of the fountain pen.

It will, of course, be understood that numerous details of construction may be varied through a wide range without departing from the principles of this invention, and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. A fountain pen comprising a barrel having means therein defining an annular seat, a filler unit in said barrel having a base seated on said seat, said filler unit comprising a multiple type bulbous structure of resilient rubber, or the like, and a plunger means, when in normal closed position having a telescoping engagement with the bulbous structure, and when in an operating position having a connection with the bulbous structure to operate the same with the reciprocation of the plunger means to fill the barrel.

2. A fountain pen comprising a barrel having a seat in one end thereof, a feed bar and pen point engaged in the opposite end of the barrel, an intake tube connected with the feed bar and disposed within the barrel, a rubber-like bulbous structure in said barrel seated on said seat, and a plunger mechanism normally projecting into the bulbous structure and adapted to be projected out of the end of the barrel and connected with the bulbous structure to cause operation of the bulbous structure and filling of the fountain pen barrel when the plunger mechanism is reciprocated.

3. A fountain pen comprising an elongated barrel having an annular seat formed in one end thereof, a section at the opposite end of the barrel, an ink guard formed on the outer end of said section, a pen point and a feed bar projecting through the ink guard and into said section, an intake tube secured in the inner end of the feed bar and projecting through the barrel to within a short distance of the annular seat, a filler unit engaged in the opposite end of the fountain pen barrel and seated on said seat, said filler unit comprising a resilient open bulbous structure of rubber or the like, a plunger stem longitudinally adjustable through the bulbous structure, means for releasably locking the plunger stem with the bulbous structure when the plunger stem is in outwardly projecting position with respect to the fountain pen barrel, and a closure secured in the end of the barrel adjacent the bulbous structure and having the plunger stem slidably projecting therethrough to permit reciprocation thereof and operation of the bulbous structure to cause filling of the fountain pen.

4. A fountain pen comprising a barrel having a section on one end thereof, a pen point in the section, a feed bar in the section in contact with the pen point, an intake tube engaged in the feed bar and projecting into the fountain pen barrel to within a short distance of the end of the ink chamber of the fountain pen barrel, a filling unit in the outer end of the fountain pen barrel and including a multiple type bulbous structure open at both ends, an operating plunger slidably projecting out of a closure secured in one end of the barrel, said operating plunger when in closed normal position projecting axially into the bulbous structure, and means on the operating plunger and in the bulbous structure for connecting the same one to another and forming an air-tight seal when the operating plunger is moved into a position to project out of the end of the barrel into a position to permit reciprocation thereof and operation of the bulbous structure to cause filling of the fountain pen.

5. A fountain pen comprising a barrel having a section at one end thereof, a closure member in the opposite end of the barrel, a pen point and a feed bar engaged in the section, an intake tube having one end thereof engaged in the feed bar and projecting longitudinally through the barrel to within a short distance of the end of the ink chamber of the barrel, a filler unit secured in the outer end of the fountain pen barrel adjacent the barrel closure member, and including a compressible bulbous structure, an operating plunger normally projecting axially into the bulbous structure, an operating head on the operating plunger disposed to the outside of the barrel closure member and seated against the end of the barrel when the filler unit is not in use, and means for connecting the bulbous structure with the operating plunger when the operating plunger is projected outwardly through the barrel closure member to permit operation of the bulbous structure to cause filling of the fountain pen barrel when the operating plunger is reciprocated by means of the plunger head.

6. In a fountain pen a filler unit for insertion in one end of the fountain pen barrel, said filler unit comprising a bulbous rubber-like structure including a base secured in the fountain pen barrel, and a plunger means projectible through one end of the fountain pen barrel and movable into a position to project into the bulbous structure when the filling unit is not in use, and projectible out of the end of the fountain pen barrel with the inner end thereof including means for connection with the bulbous structure to cause operation thereof with the reciprocation of the plunger means to fill the fountain pen.

7. In a fountain pen, a filler unit comprising a collapsible bulbous structure secured in one end of the fountain pen barrel, a bushing for closing one end of the barrel, an operating stem projecting through the bushing and into the bulbous structure when the filler unit is not in use, said stem movable outwardly with respect to the bulbous structure to project out of the end of the fountain pen barrel, and means for locking the inner end of the stem with the outer end of the bulbous structure when the stem is in a pro-

jecting position, to cause filling of the fountain pen barrel when the stem is reciprocated to cause operation of the bulbous structure.

8. In a fountain pen, a filler unit secured in one end of the barrel of the fountain pen and comprising a bulbous structure open at both ends, an apertured packing base on one end of the bulbous structure and secured in the fountain pen barrel in tight sealing contact therewith, a bushing secured in the opposite open end of the bulbous structure, stem means projecting through the bushing into the bulbous structure, said stem means having the outer end thereof projecting through a closure in one end of the fountain pen barrel, and coacting means on the stem means and the bushing for connecting the same one to the other when the stem means is moved outwardly into an operating position for reciprocation to actuate the bulbous structure to fill the fountain pen.

9. A fountain pen including in combination a barrel having a shoulder formed therein, a closure plug closing one end of said barrel, a bulbous filling unit in the barrel adjacent the closure plug, a packing base integrally formed on the bulbous structure and seated against said shoulder in sealing contact with the interior surface of the barrel, a bushing engaged in the opposite end of the bulbous structure, a plunger stem projecting through the barrel closure plug and through the bushing into the bulbous structure, an operating head on the outer end of the plunger stem for seating against the end of the barrel and against the barrel closure plug when the plunger stem is in an inoperative position projecting into the bulbous structure, and means on the plunger stem and said bushing for coaction with one another when the plunger stem is moved into an outwardly projecting operating position with respect to the barrel and the closure plug thereof to permit reciprocation of the plunger stem by means of the plunger head and actuation of the bulbous structure to cause filling of the fountain pen.

10. In a fountain pen, a filler unit comprising a bulbous rubber-like structure secured in one end of the fountain pen barrel, and plunger means normally projecting into the barrel and into the bulbous structure and movable into a position projecting from the barrel to permit operation of the plunger means and the bulbous structure to cause filling of the fountain pen.

11. In a fountain pen, a filler unit secured in one end of the fountain pen barrel and comprising a bulbous rubber-like structure, a plunger means normally projecting into the barrel and into the bulbous structure and movable outwardly with respect to the bulbous structure to project from the fountain pen barrel, and means for locking the plunger means with respect to the bulbous structure when the plunger means is in its outermost position to permit operation of the bulbous structure and filling of the fountain pen when the plunger means is actuated.

12. In a fountain pen, a filler unit secured in one end of the fountain pen barrel and comprising a bulbous rubber-like structure, a grooved packing base integrally formed on one end of the bulbous structure, an apertured disc seated in the grooved base to expand the same into sealing contact with the interior of the fountain pen barrel, a stem member projecting into the fountain pen barrel and into the bulbous structure, an operating head on the outer end of the stem member normally seated against the end of the fountain pen barrel when the stem member is in its innermost position, and means on the stem member for engaging the bulbous structure when the stem member is moved into an outwardly projecting position to permit operation of the bulbous structure and filling of the fountain pen when the projecting stem member is operated.

13. In a fountain pen, a filler unit secured in one end of a fountain pen barrel and comprising a bulbous rubber-like structure, a grooved packing base integrally formed on one end of the bulbous structure, an apertured disc seated in the grooved base to expand the same into sealing contact with the interior of the fountain pen barrel, an interiorly threaded bushing in the opposite end of the bulbous structure, an operating stem projecting into the end of the fountain pen barrel and into the bulbous structure, a head on the outer end of the operating stem normally seated against the end of the fountain pen barrel, and thread means on the operating stem for threaded engagement with the interiorly threaded bushing of the bulbous structure to cause operation of the bulbous structure with the reciprocation of the stem member to fill the fountain pen, said stem member after a filling operation being rotatable to release the threaded means of the stem member from engagement with the bushing for the return of the stem member to normal position to project into the bulbous structure without actuating the same.

14. A fountain pen including in combination a filler unit comprising a rubber-like filling means, a grooved apertured base connected therewith, an apertured disc seated in the groove of said base to expand the same into sealing contact with the interior of the fountain pen barrel, a stem longitudinally projectible into one end of the fountain pen barrel and into one end of the filling means within the barrel, a valve member on the inner end of said stem for closing the aperture in said disc when the stem is in its innermost position, and means for connecting the stem with the outer end portion of the filling means when the stem is moved into an outwardly projecting position to permit operation of the filling means and filling of the fountain pen when the stem is actuated.

15. A fountain pen filling unit comprising a bellows-like section, an apertured and grooved base formed on one end thereof, an apertured disc engaged in the groove of said base, a bushing member in said bellows-like section opposite said base, a stem slidably projectible through the bushing to project into the bellows-like section, a valve member on the inner end of said stem for seating in the aperture of said disc when the stem is in its innermost position, a valve seat formed in the bellows-like section near said gasket to coact with the valve member when the stem is moved into an outermost operating position projecting from the bellows-like section, and means for releasably locking the stem with the bushing when the stem is in its outermost position for filling the fountain pen by repeatedly collapsing the bellows-like section when the stem is actuated.

16. A fountain pen including in combination a filler unit comprising a bulbous structure, a grooved apertured base formed on one end thereof, an apertured disc seated in the groove of said base, a plunger stem longitudinally projectible into the opposite end of the bulbous structure, a head on the outer end of the plunger stem for actuating the same, and means on the plunger

stem for connecting the same with the bulbous structure when the plunger stem is moved into an outwardly projecting position for actuating the bulbous structure to cause filling of the fountain pen.

17. A fountain pen including in combination a filler unit comprising a bulbous structure, an apertured and grooved base formed on one end thereof, an apertured disc in said groove of the base a threaded bushing in the opposite end of the bulbous structure, a threaded stem normally projecting axially into the bulbous structure and movable outwardly with respect thereto to cause operation of the bulbous structure to fill the fountain pen when the stem is actuated to collapse and release the bulbous structure.

18. A fountain pen including in combination a filler unit comprising a bulbous structure, an apertured and grooved base formed on one end thereof, an apertured disc seated in the groove of said base, a threaded bushing secured in the opposite end of the bulbous structure, a threaded stem engaged in the threaded bushing for longitudinal axial movement with respect to the bulbous structure, an operating head on the outer end of the threaded stem, a valve seat formed in the bulbous structure adjacent the threaded bushing, and a double valve on the inner end of the threaded bushing, and a double valve on the inner end of the threaded stem for seating in the aperture of said disc when the threaded stem is in its innermost position and for seating against the valve seat in the bulbous structure when the threaded stem is moved into its outermost operating position to permit a filling operation of the filling unit by repeatedly collapsing the bulbous structure with the operation of the threaded stem.

19. A fountain pen filling unit comprising a bulbous structure, a passaged base formed on one end thereof and having a groove therein, an apertured disc engaged in said groove, a threaded bushing secured in the opposite end of the bulbous structure, a plunger stem projecting through the bushing, a threaded head on the inner end of the plunger stem for threaded engagement with the bushing when the plunger stem is moved into an outwardly projecting position for operating the bulbous structure, and an actuating head on the outer projecting end of the plunger stem.

20. A fountain pen filling unit comprising a bulbous structure, a plunger mechanism having a telescoping engagement therewith and normally projecting axially into the bulbous structure when the filling unit is not in use, and means for connecting the plunger mechanism with the bulbous structure when the plunger is in a projecting position and is actuated for collapsing the bulbous structure for filling the fountain pen.

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