

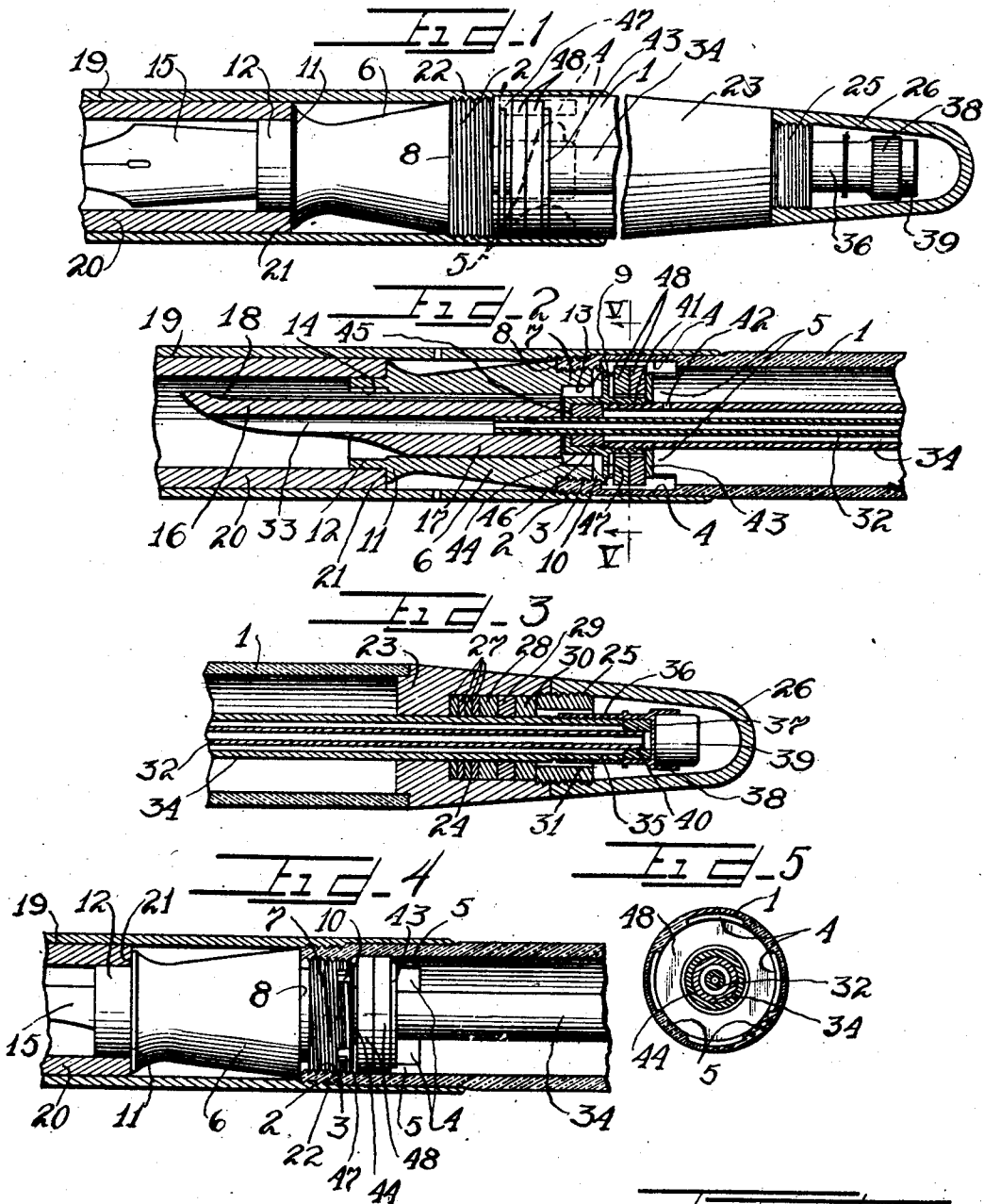
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FOUNTAIN PEN

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UNITED STATES PATENT OFFICE

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FOUNTAIN PEN

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This invention relates to an improved type of fountain pen of the plunger filler type, constructed to eject air and old ink with the outward movement of the plunger, and causing a filling of the fountain pen barrel with a downward stroke of the plunger, said plunger and filling mechanism being provided with improved packing devices and an improved piston or plunger head, which, in its innermost position, is adapted to coact with retaining ribs which separate a plurality of ink outlet passages or channels, permitting the passage of ink from the interior of the barrel around the improved piston head and into an improved fountain pen feed bar and section, with said section being provided with an ink guard for obviating the accumulation of ink on the outer end surfaces of the section where the stop sleeve within the fountain pen cap contacts the stop flange of the section, thereby affording an arrangement whereby the interior surfaces of the fountain pen cap and the exterior surfaces of the fountain pen section are kept clean from ink stains.

It is an object of this invention to provide an improved type of a plunger filling fountain pen wherein the plunger mechanisms are provided with improved packing devices for eliminating ink leakage.

It is also an object of this invention to provide an improved fountain pen of the plunger filling type wherein the interior of the fountain pen barrel near the inner end thereof is provided with a plurality of ink outlet passages separated by guide ribs which coact with an adjustable piston or plunger head and serve to retain the same in its proper shape and against expansion without obstructing the proper discharge flow of ink from the fountain pen barrel outwardly around the piston or plunger head on its way to the ink feed passage of the fountain pen feed bar.

It is a further object of this invention to provide an improved fountain pen of the plunger type wherein a plunger mechanism has telescoping engagement with a flexible filling tube connected with the feed bar, and is provided with improved packing means

between the plunger mechanism and said filling tube and between said plunger mechanism and the barrel of the fountain pen to provide a substantially leak-proof fountain pen construction.

It is furthermore an object of this invention to provide an improved fountain pen of the plunger type wherein the plunger stem and the filling tube are associated in telescoping relation and are constructed of flexible material to compensate for variations in the construction of parts and to facilitate assembly.

Still another object of the invention is to provide an improved type of fountain pen wherein a filling and discharge plunger stem has an improved piston or plunger head supported thereon and carrying a plurality of loosely associated, shiftable packing rings to insure a tight or nonleakable fit at all times during the path of travel of the piston head through the length of the fountain pen barrel, with said shiftable packing discs compensating for any variations in the diameter of the interior of the barrel inkchamber in which the piston head is reciprocally mounted.

Another object of the invention is to provide a fountain pen of the plunger type wherein the discharge end of the ink containing barrel is provided with a plurality of longitudinally disposed ink outlet passages or recesses separated by ribs of the same thickness as the thickness of the major portion of the barrel to facilitate a ready discharge flow of ink from the interior of the barrel into the fountain pen section when the plunger head of the fountain pen is in its innermost position adjacent said recesses, with said ribs serving as a guide for the piston head and acting to hold the same in its proper shape to obviate distortion or over expansion of the packing members or the body portion of said piston head.

It is also an object of this invention to provide an improved and simplified type of fountain pen provided with a plunger mechanism, the plunger head of which, when in its innermost position, is adapted to seat within the inner end of the fountain pen section and between guide ribs separating a

plurality of ink outlet recesses formed within the fountain pen barrel, said ribs acting to guide and retain the plunger head in its proper shape, allowing ink from the ink supply chamber of the barrel to pass outwardly around the plunger head and enter the inner end of the fountain pen section in which the plunger head is seated through a plurality of notches or openings provided at spaced intervals in the inner end of said section to insure a supply of ink through the section and into the ink feed grooves forming a part of the feeder of the fountain pen.

It is an important object of this invention to provide an improved and simplified type of fountain pen constructed with a plunger filling mechanism adapted to allow an ejection of air and sediment or ink through the ink intake tube on the outward movement of the plunger mechanism from the barrel and adapted to furthermore allow a drawing-in of ink into the barrel by an inward movement of said plunger mechanism, said plunger mechanism having improved packing devices associated therewith to reduce ink leakage to a minimum and insuring a proper feeding of the ink from the interior of the fountain pen barrel outwardly through a plurality of recesses separated by guide ribs which serve to strengthen the barrel at the section in which the recesses are provided and afford a guide and retaining means for holding the plunger head in its proper shape and still allowing an adequate supply of ink to be fed into the fountain pen section, which is provided with an improved ink guard for obviating the accumulation of ink on the stop flange of the section against which the shoulder of the fountain pen cap is adapted to seat when the pen is closed, so that excess ink returned from the pen point and the feeder of the fountain pen is provided with a storage space within the ink guard, thereby maintaining the various parts of the writing end of the fountain pen and the interior of the fountain pen cap clean and free from ink accumulations and stains.

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

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

On the drawing:

Figure 1 is an enlarged fragmentary elevational view of an improved fountain pen embodying the principles of this invention, with the plunger enclosing cap shown in section and with the fountain pen cap partly broken away and also illustrated in section.

Figure 2 is a longitudinal fragmentary sectional view taken through the writing end of the fountain pen, with the closure cap in position and illustrating the innermost posi-

tion of the plunger head positioned between the ink outlet passages and having seated coacting relation with the inner notched end of the fountain pen section.

Figure 3 is an enlarged longitudinal detail section of the outer end of the fountain pen, illustrating the telescoping relation of the ink intake tube and the plunger stem and the improved packings for obviating leakage.

Figure 4 is a fragmentary longitudinal sectional view of the writing end of the fountain pen, with the barrel shown in section and with the plunger head and the section illustrated in elevation and in abutting, coacting relation illustrating the normal position of said parts.

Figure 5 is a transverse detail section of the fountain pen taken on line V—V of Figure 2.

As shown on the drawing:

The reference numeral 1 indicates a fountain pen barrel or body, preferably constructed of a transparent material, but, of course, adapted to be constructed of an opaque material if desired. The fountain pen barrel 1 is exteriorly threaded at 2 at its inner end and is also interiorly threaded at 3. The interior of the fountain pen barrel 1 immediately adjacent the inner end of the threaded section 3 is formed to provide a plurality of longitudinally positioned ink outlet passages or recesses 4 separated by means of a plurality of longitudinally positioned ribs or guide bars 5. The guide bars or ribs 5 are formed by the ink outlet passages 4 and serve to strengthen that portion of the fountain pen barrel in which the passages are provided. Connected to close the inner end of the fountain pen barrel 1 is a fountain pen section comprising a body portion 6 having integrally formed on the inner end thereof a reduced, exteriorly threaded shank or collar 7 which threads into the interiorly threaded portion 3 of the barrel to permit the end of the barrel to seat tightly against a shoulder 8 provided on said section.

The end of the section shank 7 is beveled off to provide a plunger head seat 9 and is also provided with a plurality of spaced notches 10 adapted to be positioned to communicate with the ink outlet passages or recesses 4 to permit ink to pass from the interior of the fountain pen barrel into the fountain pen section 6. The outer end of the fountain pen section 6 is flared outwardly to provide a stop flange or rim 11 at the inner end of an ink guard collar or sleeve 12 which is integrally formed on the outer end of said section and is of reduced diameter to provide the stop shoulder on the stop flange 11. The section body portion 6 is provided with an axial passage, the inner end of which communicates with a chamber 13 provided in the threaded shank portion 7 of the fountain pen section. The ink guard

collar 12, has the passage or inner diameter thereof slightly enlarged to provide an ink guard recess or ink-receiving pocket 14 for the reception or temporary storage of excess ink returned from the pen point 15 of the fountain pen. The pen point 15 has the shank portion thereof projecting through the ink guard collar 12 and into the interior of the section 6, with said pen point being engaged over the tip or head end 16 of a fountain pen feeder provided with a shank portion 17 which projects through the body portion of the section and has the inner end thereof rigidly engaged in the axial passage of said section, with the inner end of the feeder shank terminating at the chamber 13 of the shank portion 7 of said section. The feeder is provided on its upper side with a longitudinally directed ink feed groove or passage 18, the inner end of which opens through the end of the shank portion of the feeder and communicates with the ink supply chamber 13 to permit a supply of ink to be fed outwardly through the feed groove or passage 18 to the pen point 15.

The fountain pen is provided with a cap 19 having rigidly engaged in the closed end thereof a stop sleeve 20, the inner end of which affords a stop shoulder at 21 adapted to seat against the stop shoulder afforded by the section flange 11 when the cap is engaged over the writing end of the fountain pen barrel. The interior of the fountain pen cap 19, a short distance from the open end thereof, is provided with an interiorly threaded section 22 which is adapted to have threaded engagement with the exteriorly threaded shank portion 2 of the fountain pen barrel for the purpose of holding the cap tightly mounted in position with the stop shoulder 21 tightly seated against the stop shoulder afforded by the section flange or rim 11 and with the ink guard 12 projecting into the inner end of the stop sleeve 20 provided in the cap 19, thereby affording an arrangement permitting any excess ink remaining on the pen point or on the head section 16 of the feeder to flow backwardly into the ink receiving recess or chamber 14 provided by the ink guard extension, from which pocket the excess ink may gradually find its way back into the feed passage of the feeder to be eventually returned into the chamber 13 to find its way back into the fountain pen barrel. By providing the ink guard 12, the excess ink receiving pocket 14 prevents the excess ink from lodging against the outer end of the ink guard sleeve or collar 12 and also prevents any of the excess ink from coming into contact with the stop shoulder provided by the stop flange 11 of the section, so that no ink is brought into contact with the stop shoulder 21 of the fountain pen cap. This arrangement prevents excess ink from being spread to the inner surfaces of the

fountain pen cap and also obviates the spreading of ink to the exterior surfaces of the fountain pen section, so that the writing end of the fountain pen is always kept clean and free from ink stains.

Rigidly engaged in the outer end of the fountain pen barrel 1 is a barrel head or plunger guide 23, the inner end of which is grooved or otherwise shaped to permit the same to be rigidly fitted into the outer end of the barrel 1. The barrel head is axially passaged and is provided with an enlarged chamber or recess 24 in the outer end thereof, in which a packing unit is rigidly secured or held in position by means of an externally threaded retaining thimble or bushing 25, one end of which is threaded into the internally threaded outer end of the packing unit recess or chamber 24, as clearly illustrated in Figure 3, for the purpose of holding the packing unit in position. The outer end of the threaded bushing 25 has removably threaded thereon a hood or end cap 26 which completes the barrel or body portion of the fountain pen. The packing unit is of improved or special construction, and comprises a plurality of packing rings or apertured discs 27, each of which comprises one or more sections each consisting of a thin middle layer of powdered or sheet cork positioned between sheets or layers of cotton cloth or paper glued or otherwise secured to the outer faces of the layer of cork and provided with a liquid coating of celluloid or pyroxyline. The plurality of packing rings 27 are seated adjacent one another, with the innermost packing ring 27 seating against the inner end wall forming the packing chamber 24. Positioned adjacent the outermost packing ring 27 is a packing ring or disc 28 which is constructed of hard rubber or other suitable material. Engaged to the outside of the hard rubber packing ring 28 is a packing ring 29 constructed of soft rubber or other suitable material and having the inner diameter thereof slightly smaller than the inner diameters of the packing rings 27 and 28 to permit the same to extend into the axial passage of the closure head 23 to serve as a wiping member of the packing unit. Positioned to the outside of the soft rubber ring or washer 29 is another ring or disc 30 constructed of a hard material, such as hard rubber or the like. The various packing members thus described are arranged as mentioned and are adapted to be tightly held in position by means of the retaining bushing 25, the outer threaded end of which serves as a means for attaching the closure hood or cap 26. The inner diameter of the bushing 25 is slightly larger than the diameter of the axial passage through the closure head 23 and affords a chamber 31. For the purpose of filling the fountain pen barrel 1 with ink, a plunger mechanism

is provided. The filling mechanisms for the fountain pen consist of an ink intake and outlet tube 32 constructed of flexible hard rubber or other suitable flexible material and has one end thereof securely projecting into the inner end of an ink intake duct, conduit or passage 33 which extends longitudinally through the feeder or feed bar 16—17 and has the outer end thereof terminating in the under side of the tip end of the feed bar head section 16. The flexible ink intake tube 32 projects through the barrel 1 and through the passage provided in the barrel head 23, with the open end of said flexible ink intake tube positioned beyond the end of the retaining bushing 25. Slidably engaged in the fountain pen barrel 1 in telescoping relation with the flexible ink intake tube 32 is a plunger stem or hollow rod 34 constructed of hard flexible rubber or other suitable flexible material which has a tight, non-leakable fit where it passes through the packing unit provided in the barrel head 23. The outer end of the plunger stem 34 is provided with an externally threaded portion at 35 to permit an internally threaded plunger cap 36 to be threaded thereon to close the outer end of said stem. The cap is provided with a partition or end closure wall 37 and with a rim extension 38 which provides a pocket in the outer end of the cap 36 for the reception of a removable ink eraser 39. Within the plunger stem cap 36 and abutting the inner surface of the partition or closure end plate 37 of said cap is a packing collar or sleeve 40 constructed of flexible or compressible packing material and having the outer end so positioned that, when the closure cap 36 is threaded onto the exteriorly threaded portion 35 of the plunger stem 34, the end of said packing sleeve is adapted to be brought into contact with the end of the plunger stem, thereby causing the packing sleeve to be compressed, so that the inner diameter thereof will be reduced, causing a tight, non-leaking fit around the exterior surface of the ink intake tube 32. By tightening the cap 36 on the outer end of the plunger stem 34, it will be noted that the compressible packing sleeve or collar 40 may be adjustably compressed from time to time to permit the packing sleeve to have a tight, non-leakable fit around the ink intake tube 32 when the plunger stem is in its innermost position, as illustrated in Figure 3. When the plunger is in its innermost position, the inner end of the plunger cap 36 projects into the recess 31 provided in the bushing 25, and said cap 36, together with the eraser 39 engaged in the outer end thereof, is adapted to be enclosed by means of the hood or cap 26.

The inner end of the plunger stem 34 is externally threaded at 41 and is provided with one or more apertures 42 adjacent the inner

end of the threaded section 41, as clearly illustrated in Figure 2. At the inner end of the threaded portion 41 of the plunger stem, a stop shoulder is formed, against which a retaining disc or ring member 43 is adapted to seat to be clamped against the inner end of a plunger or piston head 44 which is internally threaded at one end to permit the plunger or piston head to be threaded onto the threaded end 41 of the plunger stem 34. The retaining disc 43 is thus clamped between the shoulder on the plunger stem 34 and the inner end of the plunger head 44. The outer end of the plunger or piston head 44 is provided with an apertured end plate or flange 45 to form a stop shoulder for the outer end of a compressible packing sleeve or collar 46 which is secured in the plunger or piston head 44 and is adapted to be compressed between the end of the threaded section 41 of the plunger stem and the stop flange 45 of the plunger or piston head, so that the packing sleeve or collar is adapted to be compressed to form a tight, non-leakable fit around the ink intake tube 32. By threading the plunger or piston head 44 further onto the threaded end 41 of the plunger stem 34, it will be noted that the packing sleeve or collar 46 may be compressed from time to time to adjust the same to provide a tight or non-leakable fit around the ink intake tube 32.

Engaged around the plunger or piston head 44 between the retaining disc or plate 43 and a peripheral flange or rib 47, integrally formed on the plunger head, are a plurality of packing rings or discs 48, which are loosely positioned between the flange 47 of the piston head and the retaining disc 43 and have the inner diameters thereof slightly greater than the exterior diameter of the piston head 44 to permit the packing rings 48 to be shifted diametrically with respect to one another to permit the outer peripheral surfaces thereof to have a tight, non-leaking fit with the interior surface of the fountain pen barrel 1. The shiftable packing rings or discs 48 forming a part of the plunger mechanism are of special construction, similar to the construction of the packing rings or discs 27, and each comprises an inner thin layer of powdered or sheet cork secured between outer sheets or layers of paper or cloth impregnated or coated with a liquid solution of celluloid or pyroxyline. With plunger packing discs 48 constructed as described and loosely carried on the plunger head, said discs are adapted to adjust themselves as the plunger head is moved back and forth through the length of the barrel 1 to compensate for any variations in the inner diameter or the finish of the interior of the barrel 1, so that a tight fit is insured. When the plunger is in its innermost position, as illustrated in Figure 2, the plunger head packing discs 48 are maintained in position be-

tween the guide ribs 5 positioned between the passages 4 which ribs serve to guide and retain the packing discs 48 in their proper positions, preventing the same from expanding out of shape and furthermore allowing ink from the interior of the barrel 1 to pass downwardly through the passages 4 around the plunger head and into the chamber 13 of the fountain pen section, from which the ink is permitted to flow outwardly through the feeder passage 18 to the pen point 16. When the plunger mechanism is at its innermost position, the outer end of the plunger head body portion 44 projects into the chamber 13 provided in the inner end of the fountain pen section 6, and the peripheral flange or rib 47 of the plunger head is adapted to seat against the seat 9 provided in the inner end of the section 6 without stopping off the communication between the interior of the barrel 1 and the interior of the fountain pen section chamber 13, due to the fact that the ink from the interior of the fountain pen barrel 1 passing through the passages or recesses 4 around the plunger head packing discs 48 is permitted to pass through the notches 10 of the section shank 7 into the chamber 13 to be fed to the fountain pen point 15 through the passage 18 provided in the feeder bar.

In the normal position of the parts of the improved plunger type fountain pen of this invention, the plunger mechanisms are in their innermost positions, as illustrated in Figures 2 and 3, with the eraser-carrying head or handle end of the plunger stem enclosed by means of the hood or closure cap 26. In the innermost position of the plunger mechanisms, the flange or peripheral rib 47 of the plunger or piston head is seated against the seat 9 provided in the end of the threaded shank portion 7 of the fountain pen section 6.

With the plunger mechanisms in their innermost or normal closed position, the plunger or piston head is positioned between the various ink outlet passages or recesses 4 and between the ribs or bars 5 which separate the recesses and afford not only a guide means for the plunger head but also act as a means for preventing the plunger head packing discs or rings 48 when positioned adjacent or between the recesses 4 from expanding out of shape, which has been a considerable source of trouble in fountain pens of the plunger type wherein a continuous inner peripheral groove is provided in the fountain pen barrel to permit ink from the interior of the barrel to pass around the plunger head and into the fountain pen section. In the innermost position of the plunger mechanisms, the plunger stem 34 is telescoped or engaged over the ink intake flexible tube 32, the outer end of which projects tightly into the packing sleeve or collar 40, thereby closing off communication with the interior of the ink intake or supply tube 32 and the interior cham-

ber provided by the hollow or passaged plunger stem 34. The improved packing units mounted within the recess provided in the head member or section 23 of the fountain pen provide a non-leakable joint around the plunger stem where it projects through the head 23. Another non-leakable joint is provided between the exterior of the ink intake tube 32 and the plunger head unit which contains the compressible packing sleeve or collar 46 which fits tightly around the exterior of the tube 32, as clearly illustrated in Figure 2.

The improved fountain pen of this invention is of the plunger type in which the interior of the fountain pen barrel 1 is adapted to be cleaned out or emptied of any sediment, ink and the like which may be engaged within the fountain pen barrel 1 or within any of the passages therein. To fill the fountain pen, the main cap 19 is removed from the writing end of the pen and the hood or auxiliary cap 26 is then unthreaded from the bushing 25, exposing the head or handle end 38 of the plunger mechanism. The head end of the feeder bar is now positioned over a container of any kind adapted to receive the old ink and sediment from the fountain pen barrel. The ejection of the old ink and sediment is brought about by pulling outwardly on the plunger stem 34, thereby causing the plunger or piston head to slide upwardly within the barrel 1 to cause any ink within the barrel 1 to be forced outwardly through the apertures 42 into the interior of the plunger stem 34 and into the inner open end of the flexible tube 32 through which the ink and any sediment is adapted to be forced outwardly through the passage 33 provided in the feed bar. It will thus be noted that, on the outward stroke of the plunger mechanism, the interior of the fountain pen is adapted to be cleared of sediment and any old ink which may be stored therein or left from a previous filling. When the interior of the fountain pen is cleared of sediment, old ink or any other material, the tip or head end of the feed bar is adapted to be inserted in a fresh supply of ink and the plunger mechanism is moved inwardly, causing a vacuum to be produced between the plunger head and the head member 23 forming a part of the body of the fountain pen, thus causing an inward suction upwardly through the passage 33 and the flexible tube 32, causing a fresh supply of ink to pass upwardly through the tube 32 over the open end thereof into the interior of the plunger stem 34 from which the ink is permitted to escape through the apertures 42 into the barrel chamber which is thus filled with a fresh supply of ink. The filling operation takes place until the plunger stem is moved into its innermost position, in which the free end of the ink intake tube 32 is permitted to be enclosed by the packing sleeve or collar 40

of the plunger cap or handle 36, so that said packing sleeve or collar 40 is tightly engaged around the exterior surface of the outer end of the tube 32, thereby closing off the supply of ink into the plunger stem 34. It will thus be noted that the fountain pen is adapted to be filled with the inward stroke of the piston, so that, after a filling operation, with the plunger mechanisms in their innermost or normal position, the closure hood or auxiliary cap 26 is again adapted to be threaded onto the projecting end of the bushing 25 to close the operating end of the fountain pen, which is now ready for further use, since the supply of ink has been replenished.

When the pen is put into use, ink from the ink supply chamber of the barrel 1 is permitted to flow outwardly through the plurality of passages or recesses 4 around the packing discs forming part of the plunger head mechanism through the notches or recesses 10 of the shank portion 7 of the fountain pen section into the chamber 13, from which point the ink is adapted to enter the feed groove or passage 18 in the feed bar to flow outwardly to supply the pen point 15 with ink.

After the fountain pen has been in use and is no longer required for writing at the time being, the writing end of the fountain pen is adapted to be closed by means of the main closure cap 19 which is engaged over the pen point end of the barrel in the customary manner and is then threaded into position by causing the threaded section 22 thereof to be threaded onto the threaded portion 2 of the fountain pen barrel 1. As the cap 19 is engaged in position, the shoulder 21 provided on the inner end of the stop sleeve 20 engaged within the closed end of said cap is adapted to be brought into seating engagement with the stop surface of the flange or mouthpiece 11 of the fountain pen section 6, as clearly illustrated in Figures 1 and 2. With the cap 19 engaged in position as described, the ink guard 12 projects into the inner end of the sleeve 20. With the fountain pen in closed position, the same is adapted to be engaged in a pocket or other suitable support with the pen point end projecting upwardly, thereby permitting any unused or excess ink left on the pen point 15 or in the groove 18 of the feed bar to flow downwardly, or backwardly, into the excess ink receiving chamber or recess 14 provided in the ink guard 12 without permitting the ink to come in contact with the outer end of the ink guard or into contact with the stop flange or mouthpiece 11 of the fountain pen section 6. This arrangement obviates the settling of ink on the flange 11 or the exterior of the ink guard, so that excess ink is not distributed to the interior surfaces of the fountain pen cap 19 or to the exterior surfaces of the ink guard 12 or the fountain pen

section 6, so that the various parts of the fountain pen are kept in a clean condition, so that the fingers of a person using the pen are not apt to become stained with excess ink.

With a definite recess or pocket provided within the ink guard 12 for the reception of the excess or returned ink from the pen point and the outer end of the feed bar, excess ink is prevented from coagulating on the outer end of the ink guard 12 and on the mouthpiece or stop flange of the fountain pen section, and the excess ink is instead permitted to gradually flow back through the feed bar passage 18 into the section chamber 13 through the notches 10 and the passages or recesses 4 into the ink supply chamber of the fountain pen barrel 1.

In case the fit of the packing collars 46 and 40 around the exterior of the ink intake tube 32 become loose, the packing collar 40 may be adjusted or compressed by simply threading the handle cap 36 further onto the outer end of the plunger stem threaded section 35, thereby compressing the packing collar 40 to cause the same to again fit tightly around the exterior of the tube 32. In a similar manner, the packing sleeve or collar 46 within the plunger head 44 may be compressed or expanded to tightly fit around the tube 32 by threading the stem 34 further into the threaded end of the plunger head 44 against the packing collar or sleeve. When necessary, it will, of course, be understood that the packing collars or sleeves 40 and 46 may be replaced by new flexible or compressible packing members to insure a proper non-leaking fit around the tube 32.

Attention is called to the novel construction of the plunger head mechanism wherein a plurality of special packing rings or discs 48 are loosely engaged around the exterior of the plunger or piston head 44 between the piston head flange or rib 47 and the retaining ring or disc 43. With the diameter of the opening in the rings or discs 48 being slightly greater than the exterior diameter of the piston or plunger head 44, the packing discs 48 are adapted to be shifted diametrically with respect to one another and are also adapted to be shifted longitudinally on the plunger head 44 between the flange 47 and the retaining ring or disc 43. This novel arrangement permits the packing rings or discs 48 to shift with respect to one another as the plunger mechanism is moved inwardly and outwardly within the fountain pen barrel 1, so that the plunger mechanism may always have a tight, non-leaking fit with the inner wall of the barrel 1 to compensate for any irregularities in the bore or finish of the interior of the barrel and furthermore providing an arrangement insuring proper filling of the fountain pen barrel on the inward or down stroke of the plunger mechanism.

nism and a complete cleaning out of the interior of the barrel and the grooved parts of the fountain pen on the outward stroke of the plunger mechanism.

For the purpose of assisting and advising a user of the fountain pen as to the quantity of ink contained within the barrel 1, said barrel is preferably constructed of a transparent material which will permit the quantity of ink contained within the barrel to be readily discernible, so that a person can readily tell when the fountain pen needs refilling.

Another important improvement in the fountain pen is the provision of an ink, or, if desired, a pencil, eraser 39 in the chambered outer end of the plunger cap or handle 36. An eraser is thus readily accessible at any time it is required by merely removing the hood or auxiliary cap 26 from the head section 23 of the fountain pen body.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention, and it is, therefore, not purposed 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 body section, a feed bar and a pen point engaged in one end thereof, a flexible filling tube extending from said feed bar into said body section, a plunger stem in said body section slidably engaged over said flexible tube, a plunger head engaged on said stem and surrounding said flexible tube, adjustable packing means in said plunger head surrounding said tube and adapted to be adjustably compressed with the adjustment of said stem into said plunger head, a closure cap adjustably engaged on one end of said plunger stem, and an adjustable packing in said cap engaged around said flexible stem when the plunger stem is in its innermost position and adapted to be compressed to provide a tight fit around said tube with the adjustment of said cap on said plunger stem.

2. A fountain pen comprising a body section, a pen point and a feed bar engaged in one end of said body section, a passaged closure head secured in the opposite end of said body section, a flexible filling tube connected with said feed bar and projecting upwardly through the body section and through said closure head, a packing unit seated in said passaged closure head, an apertured plunger stem slidably engaged through said closure head and the packing unit thereof and having a loose telescoping engagement around said flexible filling tube, a closure cap adjustably engaged on one end of said plunger stem, an adjustable packing member contained in said closure cap and adapted to be adjustably compressed with the adjustment

of said cap on said plunger stem to cause a tight fit of said packing member around the exterior of said filling tube when the plunger stem is in its innermost position, a plunger head adjustably engaged on the inner end of said plunger stem, a packing member engaged in said plunger head and around said filling tube and adapted to be adjustably compressed to provide a tight, non-leaking joint around said filling tube, and a plurality of relatively shiftable packing members adjustably engaged on the plunger head for coaction with the interior of the body section of the fountain pen.

3. A fountain pen comprising a body section, a pen point and a feed bar engaged in one end of said body section, a passaged closure head secured in the opposite end of said body section, a flexible filling tube connected with said feed bar and projecting upwardly through the body section and through said closure head, a packing unit seated in said closure head, an apertured plunger stem slidably engaged through said closure head and the packing unit thereof and having a loose telescoping engagement with said flexible filling tube, a closure cap adjustably engaged on one end of said plunger stem, an adjustable packing sleeve secured in said closure cap and adapted to be adjustably compressed with the adjustment of said closure cap on said plunger stem to cause a tight fit of said packing sleeve around the exterior of said filling tube to close said tube from communication with the interior of said plunger stem when said plunger stem is in its innermost position, a plurality of spaced ribs formed in one end of the body section and providing a plurality of ink outlet passages, a plunger head adjustably engaged on the inner end of said plunger stem, a packing sleeve engaged in said plunger head and around said filling tube and adapted to be adjustably compressed with the adjustment of said plunger stem into said plunger head, and a plurality of relatively shiftable packing members adjustably engaged on the plunger head adjustably adapted to frictionally fit the interior surface of the body section when the plunger head is reciprocated and also adapted to be confined to their proper shape by said ribs when the plunger head is in its innermost position, permitting the escape of ink from the body section outwardly through the outlet grooves around the plunger head and into the feed bar to supply the pen point with ink.

4. A fountain pen comprising a body section, a feed bar and a pen point engaged in one end thereof, a filling tube connected with said feed bar and projecting into said body section, a plunger mechanism disposed in the body section having the parts thereof adjustably connected one with the other, and

a plurality of packing units engaged within said plunger mechanism and surrounding said filling tube adapted to be adjustably compressed with the adjustment of the various members forming the plunger mechanism to provide a non-leakable fit between the filling tube and said plunger mechanism.

5. In a fountain pen of the class described, the combination with a barrel section, a feed bar engaged in one end thereof, a filling tube connected with said feed bar and projecting into said barrel section, a plunger mechanism reciprocally mounted in the barrel section and having telescoping engagement with the filling tube, said plunger mechanism constructed of a plurality of adjustably connected parts, and a plurality of packing units enclosed by said plunger mechanism and positioned between the parts thereof adapted to be adjustably compressed with the adjustment of said plunger mechanism parts with respect to one another to cause the packing units to be maintained in tight-fitting, frictional engagement with said filling tube.

6. A fountain pen comprising a barrel section, a feed bar in one end of the barrel section, a filling tube connected with said feed bar and projecting into the barrel section, a sectional plunger mechanism in the barrel section having telescoping engagement with the filling tube to discharge air and sediment through the filling tube on the outward movement of the plunger mechanism with respect to the barrel section and further adapted to allow a drawing of ink into the barrel section through the filling tube and the plunger mechanism with an inward movement of said plunger mechanism, and a plurality of packing sleeves positioned within the plunger mechanism adapted to be compressed with the adjustment of the plunger mechanism sections with respect to one another to maintain a non-leakable sliding fit between the plunger mechanism and said filling tube, with one of said packing sleeves serving to close off communication between the interior of the filling tube and the interior of said plunger mechanism when the plunger mechanism is in its innermost position.

7. A fountain pen of the class described comprising a body section, a feed bar engaged in one end thereof and having a filling passage therethrough, a filling tube projecting into one end of said filling passage and extending upwardly into the body section, a filling plunger of hollow construction, adjustable means in the plunger adapted to fit snugly but shiftably over the filling tube, and an adjustable packing unit within the plunger adapted to be moved out of engagement with said filling tube to provide a filling communication through the feed bar passage and filling tube and through the

plunger around said tube when the plunger is operated and adapted to shut off communication between the interior of said tube and the interior of said plunger when the plunger is in its innermost position with the packing unit engaged around the end of said filling tube.

8. A fountain pen of the class described comprising a body section, a feed bar engaged in one end thereof and having a filling passage, a filling tube engaged in said feed bar passage and projecting upwardly into the body section, a filling plunger of hollow construction having adjustable packing means therein to fit snugly and shiftably over the filling tube, said plunger having the interior thereof in communication with the interior of said tube when the filling plunger is moved out of its innermost position, and an adjustable closure unit engaged in the filling plunger adapted to be moved into snug-fitting engagement with one end of the filling tube when the filling plunger is in its innermost position to shut off communication between the interior of said tube and the interior of said filling plunger.

9. In a fountain pen of the class described, a movable ink filling plunger mechanism consisting of a plunger head, an apertured plunger stem adjustably connected with said head, a packing unit in said plunger head adapted to be engaged by said plunger stem to permit adjustable compression of the packing unit, a closure member adjustably engaged on the opposite end of said plunger stem, and another packing unit in said closure member adapted to be engaged by the plunger stem to permit compression of the packing unit with the adjustment of the closure member with respect to said stem.

10. In a fountain pen of the class described, a movable filling plunger mechanism comprising a piston head, a packing unit engaged therein, an apertured plunger stem adjustably engaged in said plunger head to contact the packing unit and compress the same, a plurality of relatively shiftable packing members engaged around the plunger head, a closure cap adjustably engaged on the plunger stem, and a packing unit in said closure cap adapted to be contacted and compressed by the adjustment of said closure cap with respect to the plunger stem.

11. In a fountain pen of the class described, the combination with an ink intake tube, of an ink filling plunger having telescoping engagement with said tube and comprising a plunger head, relatively adjustable packing members movably engaged on said plunger head, a packing unit in said plunger head engaged around said tube, an apertured plunger stem adjustably engaged in said plunger head and contacting said packing unit to permit the same to be adjustably compressed, a

closure cap adjustably engaged on one end of said plunger stem, and a packing unit in said closure cap adapted to be adjustably compressed between the closure cap and said plunger stem and affording a shut-off means between the interior of said tube and the interior of said plunger stem when said plunger mechanism is in its normal innermost position with respect to said tube.

12. In a fountain pen of the class described, the combination with an ink intake tube, of a hollow plunger mechanism having telescoping engagement therewith, and a plurality of adjustable packing units positioned between said tube and said plunger mechanism to provide non-leaking joints therebetween, one of said adjustable packing units serving as a closure means for shutting off communication between the interior of said tube and the interior of said plunger mechanism when the plunger mechanism is in its innermost position with respect to said tube.

13. A fountain pen of the class described comprising a barrel section, having a plurality of ink outlet passages provided in the interior of one end thereof, a notched section engaged in one end of said barrel section with the notches thereof in communication with said passages, a feed bar engaged in said notched section, an ink intake tube connected with said feed bar and projecting upwardly into the barrel section, a plunger mechanism engaged in said barrel section and having telescoping engagement with said tube and adapted in its innermost position to seat in the notched end of said notched section, said notches permitting escape of ink from said outlet passages when the plunger mechanism is seated in said notched section, and a plurality of relatively shiftable packing members adjustably engaged on the plunger mechanism for coaction with the interior of said barrel section, said relatively shiftable packing members adapted to adjust themselves to conform to the interior formation of the barrel section when the plunger mechanism is operated.

14. In a fountain pen of the class described, a plunger mechanism comprising an apertured plunger stem, a plunger head adjustably engaged on one end of said stem, a packing unit compressibly engaged between said plunger head and said stem, a plurality of relatively shiftable packing members loosely mounted on said plunger head, a cap adjustably engaged on the opposite end of said stem, and a compressible packing unit engaged between said cap and the plunger stem.

15. In a plunger type fountain pen of the class described, a plunger mechanism comprising an apertured plunger stem, a plunger head adjustably engaged on one end thereof, a packing unit between said plunger head and said stem, a peripheral flange integrally

formed around said plunger head, a stop disc engaged between the plunger head and a stop shoulder formed on said stem, a plurality of relatively shiftable packing members engaged on said plunger head between said flange and said stop disc, a cap adjustably engaged on the opposite end of said stem, and a packing unit between said cap and said stem.

16. In a fountain pen of the plunger type, the combination with an ink barrel having a plurality of ink passages provided longitudinally near one end of the inner face thereof and separated by a plurality of guide bars, of a section having a chambered end engaged in one end of said ink barrel and a plurality of notches in said chambered end with the notches in communication with said ink passages, and a plunger reciprocally mounted in said ink barrel and adapted in its innermost position to seat against the notched end of said section between said guide bars which retain the plunger in proper shape and permit the escape of ink from said ink barrel through said passages and through the notches of said section.

17. In a fountain pen of the class described, the combination with a transparent barrel having a plurality of ink outlet passages provided in the interior near one end thereof, said passages affording a plurality of reinforcing bars for strengthening the recessed portion of the barrel, a section, a notched shank integrally formed on one end thereof for engagement with said barrel with the notches of said shank affording communication between said passages and the interior of said section.

18. In a fountain pen of the class described, the combination with a barrel having a plurality of ink outlet passages provided longitudinally in the interior near one end thereof, said passages affording a plurality of reinforcing bars for strengthening the recessed portion of the barrel, a section, and a threaded shank integrally formed on one end thereof for engagement with said barrel and having a plurality of notches in the rim of said shank affording communication between said passages and the interior of said section.

19. In a fountain pen of the class described, the combination with a barrel, of a plunger mechanism reciprocally mounted therein, a pair of stop members engaged on said plunger mechanism near one end thereof, and a plurality of packing members engaged on said plunger mechanism shiftable longitudinally between said stop members and having relative diametrical shifting movement with respect to one another.

20. In a fountain pen of the class described, the combination with a barrel having a plurality of separated ink outlet passages provided in the interior near one end thereof, of a section engaged in one end of said barrel

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and having a chamber in the inner end thereof and notches in the wall of said chamber adapted to be positioned to register with the passages of said barrel.

- 5 21. In a fountain pen of the class described, the combination with a transparent ink containing body section, of a plunger filling mechanism therein, and a plurality of packing members diametrically and longitudinal-
10 ly shiftable thereon.

In testimony whereof I have hereunto subscribed my name at Chicago, Cook County, Illinois.

SOLOMON M. SAGER.

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