



## UNITED STATES PATENT OFFICE

2,331,606

## FOUNTAIN PEN

Benjamin W. Hanle, Elizabeth, N. J., assignor to  
Eagle Pencil Company, a corporation of Delaware

Application May 14, 1942, Serial No. 442,887

7 Claims. (Cl. 120—47)

The present invention relates to fountain pens of the plunger or piston filler type.

As conducive to a clear understanding of the invention, it is noted that where the piston rod of a pen of the foregoing type is equipped with an elaborate stuffing box or gland to inhibit leakage, the construction is inherently expensive, and, therefore, not applicable to popular priced pens; moreover, even high-priced pens of this type are open to objection because considerable force must be applied to operate the piston, in view of the resistance imposed by the tight fitting stuffing box or gland, and as a consequence of resultant wear the same becomes loose in time and leakage develops.

It is an object of the present invention to provide a pen of the plunger or piston type, which may be easily manipulated and in which the possibility of leakage is nevertheless effectively precluded throughout the life of the pen and substantially regardless of wear of the moving parts.

Another object is to provide a plunger filler of the above type which is adapted even to inexpensive pens, which dispenses with the need for rubber or specialized piston material and which does not necessitate a pen barrel of inordinately large diameter and great length for any given volume of ink storing capacity.

In the accompanying drawing is shown one of various possible embodiments of the several features of the invention.

Fig. 1 is a view of the pen partly in longitudinal cross-section showing the new plunger construction in its outermost or ink storing position,

Fig. 2 is a fragmentary view in longitudinal cross-section showing the piston in an intermediate position in the filling operation, and

Fig. 3 is a view in transverse cross-section taken on line 3—3 of Fig. 2.

Referring now to the drawing, the pen in its general external appearance is conventional, including as it does a barrel 10, a section 11 at the forward end thereof, a pen point 12 and an associated feed (not shown).

The head 13 of the barrel has a bore that defines an annular shoulder 14 at the end of the barrel bore and presents a threaded nipple 15 upon which is removably threaded the cap 16 which houses the conventional piston rod 17. The piston rod has an inner end 18 of reduced diameter which extends through an axial hole in the piston 19. That piston may be of any of a variety of compressible materials such as textile fabric, rubber, sponge, cork or the like, but felt is ordinarily preferred by reason of its low cost

and complete effectiveness in operation as will appear hereinafter. Where felt is used the same may be impregnated with wax or the like, to serve as a lubricant in the plunger operation.

Over the inner exposed face of the piston there is superposed a washer 20 of diameter somewhat smaller than that of the piston and desirably made of Celluloid or similar plastic. The extremity of the reduced piston rod end 18 is desirably upset as at 21 over the washer 20 to assemble the piston to the piston rod.

Immediately beyond the piston, the piston rod 17 is provided with a unitary threaded hub 22. Desirably, a small fibre washer 23 encircles the root of the reduced end 18 and contacts the shoulder 24 defined between the main length of piston rod 17 and its reduced end 18 at one face and the piston 19 at its other. The thread on the hub 22 coacts with a thread 25 tapped into the nipple 15. Desirably, double or triple threads are used for ease and speed of operation.

In operation, the cap 16 is removed, the piston rod 17 is turned to release the hub 22 and then pushed inward to expel the air from the barrel and finally drawn upward with the pen point submerged in the ink bottle. When the threaded hub 22 reaches the barrel head 13, the piston rod 17 is turned to thread the hub 22 into place as shown in Fig. 1. At the end of the threading operation, the compressible piston 19 will be tightly compressed by tension transmitted through the reduced rod end 18 and pressure exerted thereby upon the washer 20, thereby to cause the piston 19 to expand peripherally into snug engagement with the barrel bore and to be forced at its inner face against the annular shoulder 14 at the head of the barrel. As a consequence, the piston snugly engages the barrel head and bore to preclude the possibility of venting thereat and to maintain the ink in the barrel against the possibility of leakage therefrom.

In the compression of the piston any ink absorbed therein will drain therefrom into the barrel about the periphery exposed beyond washer 20. In the compression of said piston the felt will not be forced into the tapped bore 25 of the nipple 15 since this is prevented by the fiber washer 23.

It will be seen that the piston when relieved of the compression in the home position of Fig. 1 need not hug the pen barrel tightly, and in view of the absence of stuffing boxes or glands, the piston operates easily and without the need for applying much force. Even though the piston has a relatively loose fit, the seal thereof in the

locked position shown in Fig. 1 is complete and leakage is obviated.

As many changes could be made in the above construction, and many apparently widely different embodiments of this invention could be made without departing from the scope of the claims, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A fountain pen comprising a barrel, a compressible piston, a piston rod carrying the same and means releasably locking said rod to said barrel for axially compressing said piston and maintaining it compressed in its outermost position, for peripheral expansion thereof into snug engagement with the inner wall of the barrel.

2. A fountain pen comprising a barrel, a compressible piston, a piston rod carrying the same, means for locking the rod in its outermost position, and piston compression means connected to said rod locking means for peripherally expanding said piston under the compression exerted thereon, snugly to engage the inner wall of the barrel.

3. A fountain pen comprising a barrel, a compressible piston therein, a piston rod therefor, said rod having a threaded hub adjacent said piston, said barrel having a tapped head for accommodating said threaded hub in the outermost position of the piston, and means connected to said hub and at the inner end of said piston rod for exerting axial compression upon said piston when said hub is threaded home into the end of the barrel.

4. A fountain pen comprising a barrel having a tapped head, a compressible piston in said barrel, a piston rod having a reduced end extending axially through said piston, a relatively rigid washer over the inner face of said piston, the inner end of the piston rod being upset over said washer, said rod having a threaded hub near said piston for coaction with the tapped head

of said barrel for affixing said piston in outermost position and concurrently effecting axial compression and peripheral expansion of said compressible piston.

5. A fountain pen comprising a barrel having a tapped head and presenting an annular shoulder at the outer end of the bore thereof, a compressible piston, a piston rod therefor having a reduced end extending axially through said piston, means affixing the inner end of said piston rod with respect to the inner face of said piston, and including a relatively rigid washer overlying the inner face of the piston, a washer about the base of the reduced piston rod end and retained between the main length of the rod and the outer face of the piston and of diameter substantially no greater than that of the piston, the length of piston rod adjacent to said washer comprising a threaded hub for coaction with the tapped head of the barrel, thereby to effect axial compression and peripheral expansion of the compressible piston.

6. A fountain pen comprising a barrel having a tapped head and presenting an annular shoulder at the end of the bore thereof, a compressible piston, a piston rod having a reduced end, a small fiber washer about the root of said end, said reduced end extruding axially through said piston, a washer of diameter smaller than that of said piston superposed over the inner face thereof and about said reduced end, the latter having means at its extremity to maintain the parts in position and a threaded hub on said rod for coacting with the tapped head of the barrel.

7. As an article of manufacture, a piston structure for a plunger type pen, comprising a rod having an end of reduced diameter, a fiber washer encircling said reduced rod end and of diameter substantially that of said rod, a compressible piston encircling said reduced rod end, a washer of plastic material encircling the outer end of said rod end, the latter being upset over said washer, the end of said rod immediately beyond said piston comprising a threaded hub.

BENJAMIN W. HANLE.