Aug. 28, 1951 F. E. GRUBER 2,565,556

BALL POINT FOUNTAIN PEN

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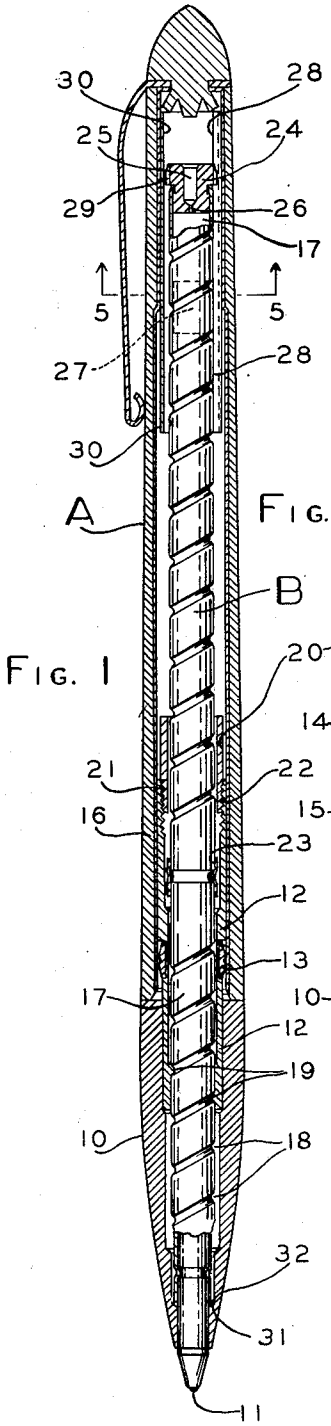

FIG. 1

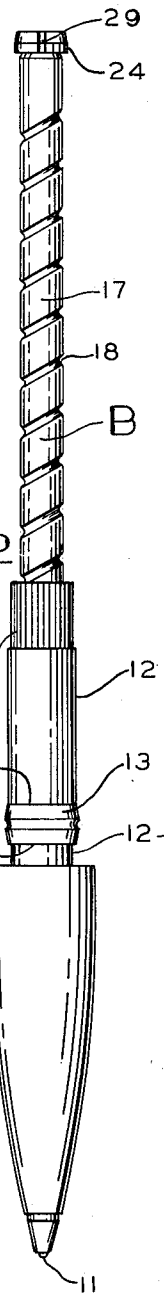

FIG. 2

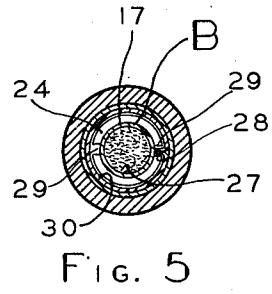

FIG. 5

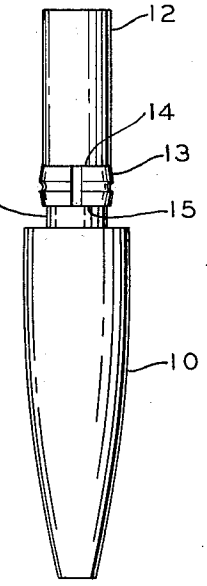

FIG. 3

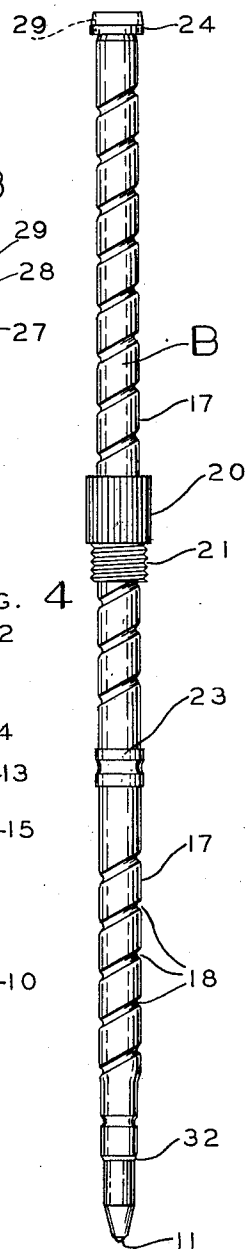

FIG. 4

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BALL POINT FOUNTAIN PEN

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My invention relates to an improvement in ball point fountain pens where the ink reservoir is adapted to be held locked in the writing tip, yet where the reservoir is movable forward and back to expose and conceal the writing ball.

A feature resides in providing a ball point pen reservoir which is made as a unit and which may be removably held in the writing tip so that a new reservoir may be substituted when a new supply of ink is desired.

A primary feature resides in providing a locking collar which is threaded to the inner end of the writing unit and which operates to either release the ink reservoir unit when it is desired to remove the same from the writing tip, or the collar acts as a shoulder working against a fixed shoulder on the ink reservoir to limit the backward movement of the ink reservoir when the writing point of the pen or ink unit is drawn back into the writing tip to protect the same.

My pen is designed to use a ball point for writing, and the casing of the pen is constructed so that it may be taken apart by a longitudinal pull on the writing tip, thus separating the writing tip and the ink reservoir unit from the rear portion of the casing of the pen. The writing tip unit with the ink reservoir is held in the casing by a frictional spring locking collar which engages within the forward end of the rear end of the casing.

In the drawings forming part of this specification:

Figure 1 is a longitudinal section of the barrel of the pen showing the ink unit reservoir partially in section.

Figure 2 illustrates an enlarged view of the writing tip with the ink reservoir as they appear when removed from the rear portion of the casing.

Figure 3 illustrates the writing tip of the pen with the ink reservoir removed therefrom.

Figure 4 illustrates an enlarged view of the ink reservoir removed from the writing tip.

Figure 5 is a section on the line 5—5 in Figure 1.

The ball point writing pen A is formed with a writing tip 10 which is formed conical on its forward end and out of which the writing end of the ink reservoir B projects so as to expose the writing ball 11.

The writing tip 10 is provided with a sleeve 12 which carries a split spring locking sleeve 13. The spring 13 operates freely between the shoulders 14 and 15. When the unit 10 is pushed into the rear portion of the casing 16, the spring sleeve 13 will contract and engage in the casing 16 and

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thereby held the unit 10 with the ink reservoir B in the casing, as illustrated in Figure 1.

The ink unit B is formed by a hollow tube which contains the writing ink. The hollow tube 17 is formed with threads 18 which act to retard the free flow of the ink used within the reservoir B and which threads on the forward end of the unit B are adapted to engage the threaded portion 19 formed within the writing tip 10, as illustrated in Figure 1.

A knurled sleeve 20 which is formed with a thread 21 on its end is adapted to limit the threading movement of the reservoir B on the thread 19 when the reservoir B is moved in a backward direction to draw the ball point 11 into the writing tip 10, thus to conceal the writing ball 11 when it is not desired for use. The threads 21 of the sleeve 20 engage the inner threads 22 formed within the sleeve 12, as illustrated in Figure 1.

The ink reservoir unit B is provided with a fixed shoulder in the form of a sleeve or similar shoulder means such as 23 which is pressed onto the reservoir B. The shoulder 23 engages against the inner threaded end 21 of the sleeve 20 when the ink unit B is moved in a backward direction by rotating the writing end 10 of the pen A.

The ink reservoir unit B is provided with a plug end 24 which closes the rear end of the tube 17 of the reservoir and which, however, is formed with the axial openings 25 and 26 to provide an air inlet into the tube 17 of the reservoir and thus permit atmospheric pressure to vary within the tube 17.

Near the rear end of the reservoir B and adjacent to the plug 25, I provide a porous filler plug 27 which assists in holding the ink within the reservoir B and prevents it from working out of the openings 25 and 26. Yet, the porous filler 27 permits atmospheric air to enter into the ink unit B and thus permits the ball 11 to draw the ink out of the reservoir B when the pen is in use and the ball is caused to write on a surface. The capillary action of the ink toward the ball 11 assists the pen A in writing.

The ink reservoir B is held against rotation by the longitudinally extending key 28 which fits into either one of the slots 29 formed in the end 24.

The key 28 is formed by a sleeve 30 which is anchored in the rear end of the casing 16.

Thus, it will be apparent when the ink reservoir B is locked in the writing tip 10 by the knurled collar 20 and the threads 18 are in engagement with the threads 19 upon the rotation of the tip 10, the threads 19 will cause the threads 18 to

propel and retract the ink unit B in accordance with the direction of rotation of the writing tip 10. The forward movement of the ink unit B to expose the writing ball 11 will be restricted by the shoulder 31 which engages against the shoulder 32 formed on the forward end of the writing unit B. The backward movement of the ink unit B in the casing of the pen A will be retarded by the lock collar or sleeve 20 which engages against the fixed sleeve 23 to restrict the backward movement of the ink unit B when the tip 10 is rotated to draw the ink unit within the casing of the pen A. In other words, one direction of rotation of the tip 10 will propel the writing ball 11 out of the conical end of the writing tip 10; whereas, the other rotation of the writing tip will draw the writing ball 11 into a position within the conical end of the writing tip 10 to conceal the ball and place it out of writing position.

Provision for a new writing unit B may become readily provided at any time in the pen stock A, by pulling the writing tip 10 with the unit B out of the rear end of the casing 16 and then unlocking the collar 20 by unsecuring the same from the threads 22 and unscrewing the unit B from the threads 19. The construction is simple, effective and permits replacement of the ink unit whenever desired, as well as provides a simple means of propelling and retracting the ink unit within the casing so as to hold the ball out of writing position.

I claim:

1. A ball point pen having a casing, a threaded removable ink reservoir having a writing ball on the forward end thereof, the forward end of said casing having a conical writing end and being separable from the rear portion of said casing, a spring collar for holding said forward end in the rear end of said casing under spring tension, a thread formed in said forward conical end of said casing adapted to engage the threads formed in said removable ink reservoir, a longitudinal key formed in the rear end of said casing and adapted to engage in a slot formed in the rear end of said ink reservoir to hold said ink reservoir against turning, an annular shoulder formed on said ink reservoir, a shoulder formed in said casing for limiting the forward movement of said ink reservoir, and a removable shoulder engaging in the forward end of said casing to limit the rearward movement of said ink reservoir, said ink reservoir being adapted to be moved longitudinally in said casing by rotating the forward conical end of said casing.

2. A ball point writing pen including a removable ink reservoir, threads formed in the body of said reservoir, a casing for enclosing said reservoir having a removable forward conical end, a spring collar for holding said forward end of said casing in the rear end of said casing, thread means formed in said forward end of said casing for engaging the threads formed in said reservoir, a fixed shoulder formed on said reservoir, means in said casing for holding said reservoir against rotation, whereby when the forward end of said casing is rotated, the thread means therein will cause said threaded reservoir to move longitudinally in said casing to expose or conceal the writing end of said reservoir, shoulder means for engaging said shoulder on said reservoir to limit the forward movement of said reservoir, and a detachable shoulder collar carried by the inner

end of said forward portion of said casing which is adapted to limit the rearward movement of said reservoir and also to permit the removal of said ink reservoir from the forward end of said casing.

3. A removable ink reservoir for fountain pens including a body portion formed of tubular material having a thread extending in said body practically from end to end thereof, an annular shoulder fixed on said body, a writing ball mounted in the forward end of said body, a collar freely rotatable on said reservoir having a threaded end, a plug adapted to be positioned in the rear end of said body, an annular shoulder formed on the rear end of said reservoir, and longitudinal keyways formed in said annular shoulder, adapted to engage lug means in a pen casing.

4. A removable ink reservoir for fountain pens having a writing end formed on the forward end thereof, an annular rear end shoulder having longitudinal keyways formed therein adapted to engage lug means in a pen casing, a shoulder formed on said reservoir adapted to limit the forward movement of said reservoir in the casing enclosing the reservoir, a threaded collar mounted freely rotatable on said reservoir adapted to limit the backward movement of said reservoir in the pen casing by being threadedly engaged to a casing.

5. A fountain pen including a casing, an ink reservoir removably supported within the casing, a shoulder formed on said ink reservoir to limit the forward and backward movement of said reservoir in said casing, a slidable locking collar carried on said reservoir which limits the backward movement of said reservoir, whereby when said collar is unlocked from the casing, a new reservoir may be placed in said casing.

6. A writing pen comprising a tubular hollow casing divided between its ends, a spring locking collar carried by one of said ends of said casing adapted to engage in the other end of said divided casing to slidably hold said portions of said casing together and a removable ink cartridge having a locking collar adapted to secure said ink reservoir in one of the portions of said divided casing.

7. An ink reservoir for a writing pen comprising a hollow tube member, a writing end formed on said tube member, a shoulder formed on said tube member, and a slidable threaded collar mounted on said tube member.

FRANCIS E. GRUBER.

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