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H. L. FISCHER
 WRITING INSTRUMENT
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2,565,601

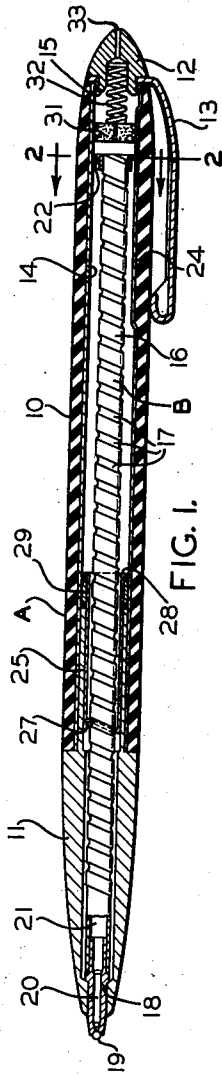


FIG. 2.

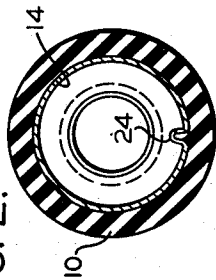
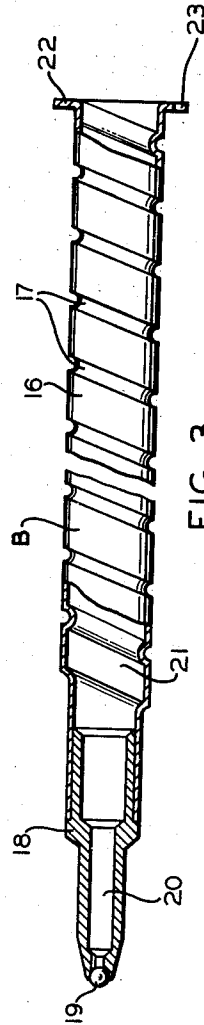


FIG. 3.

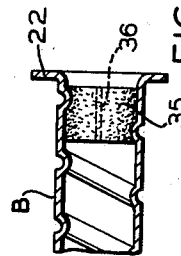


FIG. 6.

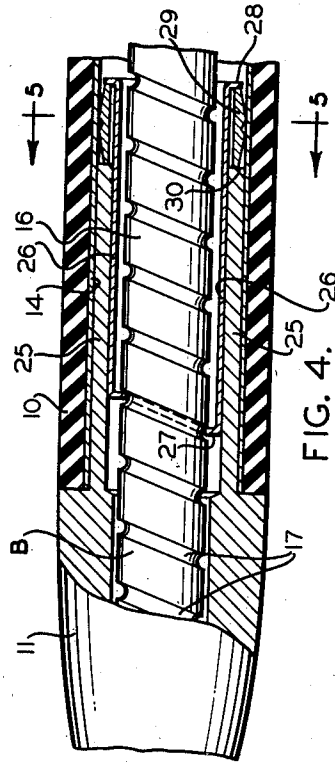


FIG. 4.

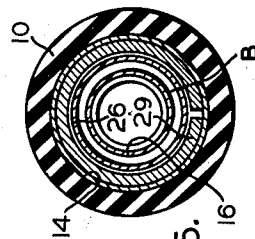


FIG. 5.

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WRITING INSTRUMENT

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2 Claims. (Cl. 120—42.03)

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My invention relates to a fountain pen which is adapted to using a ball writing point and wherein the ball is positioned in a socket freely rotatable to carry the ink from the reservoir to a surface for writing.

A feature resides in a replaceable unit ink reservoir which includes the writing ball on the forward end of the socket and wherein the reservoir is a hollow tube having a spiral thread formed in the same. The ink used in my patent is of a paste-like nature and is adapted to flow by capillary attraction to the writing ball. The thread formed in the ink tube acts to retard the backward flow of the paste ink in the ink tube or reservoir when the pen is lying in a horizontal position. When the pen is held in a writing position the ink will flow by capillary attraction to the writing ball and the rear end of the reservoir is open to the atmosphere. Thus, the atmospheric pressure is equalized in the ink reservoir.

It is also a feature of my pen to provide a means of covering the writing ball when it is not desired for use without using a cap like is used on ordinary fountain pens. This is an important feature and is accomplished by means adapted to moving the ink reservoir unit with the writing ball in a longitudinal direction in the casing of the pen.

A further feature resides in a rotatable forward end which is tapered to form the writing end of the pen and which is adapted to be rotated in a manner to cause the ink reservoir unit to be moved into or out of the pen casing.

The movement of the ink reservoir unit is accomplished by providing the writing end of the casing with a thread-engaging collar which operates on the threads of the reservoir while the reservoir unit is held against rotation by a keyway formed in the rear of the reservoir and which operates on a longitudinally extending key formed in the casing of the pen barrel.

It is also a feature to make the writing end of the casing or barrel of the pen removable which also removes the ink unit and then the ink unit can be unscrewed from the writing end of the barrel. The writing end of the barrel is held in any suitable manner so as to be freely rotatable, and I provide a spring locking collar on the inner end of the sleeve which engages in the casing or rear portion of the ball to hold the pen assembled.

These features together with other details and objects will be more fully defined as hereinafter set forth.

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In the drawings forming part of this specification:

Figure 1 is a longitudinal cross section of my ball point pen.

Figure 2 is an enlarged section on the line 2—2 of Figure 1.

Figure 3 is an enlarged side view of the ink reservoir tube a portion of which is illustrated in cross section and a portion of which is broken away.

Figure 4 is an enlarged sectional detail of the operating mechanism carried by the rotatable sleeve which forms the front end of the casing which moves the reservoir unit back and forth in the casing of the pen to conceal the writing end of the unit when desired.

Figure 5 is the section on the line 5—5 of Figure 4.

Figure 6 is a section of the rear end of the reservoir showing a porous plug for admitting air to the reservoir.

My pen A is formed with an ink reservoir unit B which is adapted to be concealed within the casing of the pen A. The casing is formed with a rear portion 10 and a forward writing end 11. The rear end of the casing 10 is closed by the member 12 which supports the pocket clip 13 which may be riveted or otherwise secured to the inner sleeve 14 at the rear point 15 of the sleeve 14.

The sleeve 14 extends within the rear portion of the casing 10 which may be made of plastic in different colors or of any other suitable material. The rear portion 10 of the casing may be formed of aluminum or any other suitable material and the sleeve 14 may be omitted, in which case the member 12 which holds the clip 13 could be threaded into the rear end of the casing 10 or otherwise anchored thereto to hold the clip in proper relation to the rear end of the casing.

The ink reservoir unit B is composed of the hollow tube 16 which is formed with a helical thread 17 extending virtually throughout its length. The tube 16 is adapted to be virtually filled with a paste-like or pulpy ink which is adapted to flow toward the writing end of the unit B by capillary attraction. The forward end of the unit B is provided with a writing tip 18 in which the ball 19 is mounted to rotate freely so as to write on the surface which the ball 19 contacts in the act of writing. The ink passageway 20 leads from the ink reservoir compartment 21 to the writing ball 19.

A helical thread 17 in the tube 16 acts to provide means for retarding the backward flow of

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the paste-like or pulpy ink contained within the chamber 21 of the unit B when the pen A is lying in a horizontal position.

The rear end of the tube 16 may be flanged outwardly to form the collar 22 which slides in the sleeve 14 and a notch 23 is formed in one side of the collar which is adapted to engage a longitudinal projecting key 24 formed in the rear end of the sleeve 14. The collar 22 may be a separate member pressed on to the end of the tube 16. Thus the engagement of the key 24 by the notch 23 tends to hold the entire writing unit and reservoir B against rotation but permitting the same to move longitudinally in the pen A.

The unit B, illustrated in Figure 3, provides the replaceable ink reservoir unit including the writing ball 19. Whenever it is desired to replace the unit B with a new unit filled with ink, it is only necessary to remove the conical writing end 11 which carries the unit B with it and then unscrew the unit B in a backward direction from the writing end 11, whereupon a new unit B may be threaded into the end 11 of the pen, then the end 11 with the unit B are inserted into the forward end 10 of the casing of the pen A, as illustrated in Figure 1.

The ink unit B is adapted to be moved longitudinally in the casing of the pen A by rotating the forward conical end 11 of the pen. The end 11 is formed with an inwardly extending sleeve 25 which slips into the forward end of the casing portion 10 and which is adapted to support the sleeve 26. The sleeve 26 is formed with an inwardly extending helical flange 27 which engages in the threads 17 of the unit B, as illustrated in Figure 4. The rear end of the sleeve 26 is formed with an annular outwardly projecting flange 28 which provides a shoulder for supporting the spring collar 29 freely rotatable on the inner end of the sleeve 26 and positioned between the flange 28 and the end 30 of the sleeve 25. This means positioned in the inner end of the writing end 11 provides the threaded engaging means for the unit B and also the locking means for removably locking the end 11 into the forward end of the front portion 10 of the pen A.

In assembling the pen A with the writing unit reservoir B in the same, the end 11 is removed from the front end 10 of the casing and a new ink unit B with the writing ball 19 is threaded into the helical flange 27. Then the writing end 11 with the unit B attached is inserted into the casing 10 and the spring collar 29 frictionally engages within the casing portion 10 to hold the front end 11 with the unit B in the casing 10.

In operating the pen A when it is desired to retract the writing ball 19 into the front end 11, it is only necessary to rotate the end 11 whereupon the engagement of the threads by the helical flange 27 will cause the entire writing unit and reservoir B to move longitudinally in the casing of the pen A, it being apparent that the unit B is held against rotation by the key 24 and keyway or notch 23.

Thus it will be apparent that no cap is required to cover the writing ball 19. It is only necessary for the operator to rotate the sleeve 11 which automatically moves the writing unit B into the barrel of the pen A and causes the writing ball 19 to be projected out of the forward end of the sleeve 11.

If it is desired to close the rear end of the unit B, a closure member 31 of felt may be provided which is supported by the spring 32 so that when the writing unit B is moved in a backward direc-

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tion the rear end of the tube 16 will engage the felt washer 31 and compress the spring 32. The felt washer 31 is porous to permit breathing of air, so to speak, to the tube 16 and through the axial air hole 33 formed in the end 12.

The rear end of the unit B may be closed with a porous felt-like plug 35 and which may be formed with a small axial opening 36 to permit the air pressure in the reservoir B to be equalized with the outward atmospheric pressure at all times.

My pen provides a writing instrument with a ball point of a simple inexpensive construction which may easily be operated and wherein a new filled ink reservoir B may be inserted at any time. It is also apparent that the reservoir may carry different colored inks such as red, blue, green, etc., and thus the pen A may be equipped in a few moments to write the desired color by changing the unit B.

I claim:

1. A writing instrument including a reservoir unit having a writing ball mounted on the forward end thereof, a helical thread formed on said reservoir unit, a casing for housing said reservoir unit, a rotatable sleeve formed by the forward end of said casing and extending into said casing, a tubular member having a rear end shoulder flange and a helical flange secured inwardly of said rotatable sleeve and adapted to engage said helical thread formed in said reservoir, a spring collar secured between said shoulder flange and the inner end of said rotatable sleeve, a key means formed within the rear portion of said casing, notch means formed on the rear portion of said reservoir adapted to engage said key means to prohibit rotation of said reservoir, whereby said reservoir may be moved into and out of said sleeve and casing.

2. In a writing instrument, a casing, a forward tip for said casing having a portion thereof adapted to fit within said casing, a reservoir positioned within said casing and said forward tip having threads formed therein, a sleeve secured within said tip having a flange formed thereon adapted to engage forward threads of said reservoir, a spring collar positioned on said sleeve engageable with the inner surface of said casing for removably retaining said tip in engagement with said casing, a ball writing point formed on the forward end of said reservoir, means for holding said reservoir against rotation in said casing, whereby when said casing is rotated against the rotation of said tip, the ball point will be projected from or withdrawn into said tip and casing.

HOWARD L. FISCHER.

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