

Jan. 22, 1957

C. K. LOVEJOY
RETRACTABLE BALL PEN
Filed Oct. 19, 1953

2,778,337

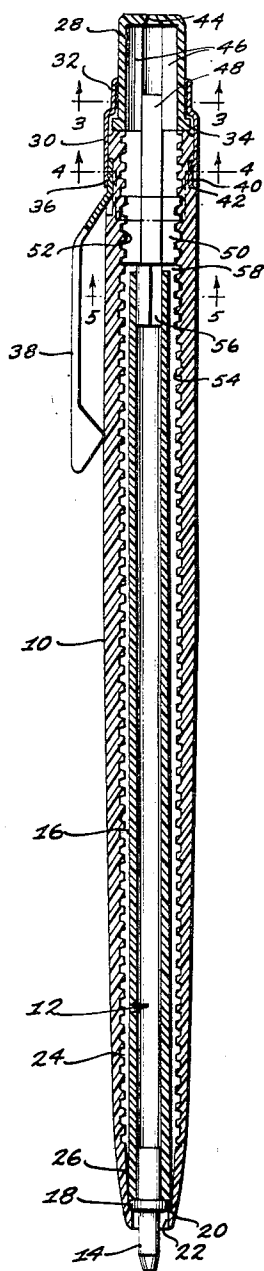


Fig. 1

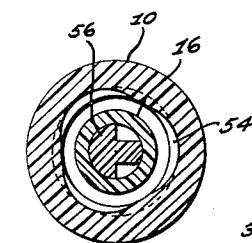


Fig. 5

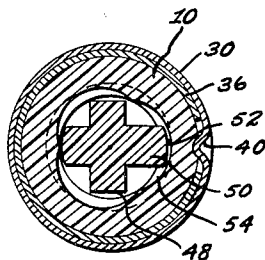


Fig. 4

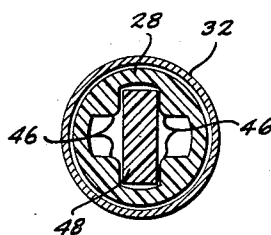


Fig. 3

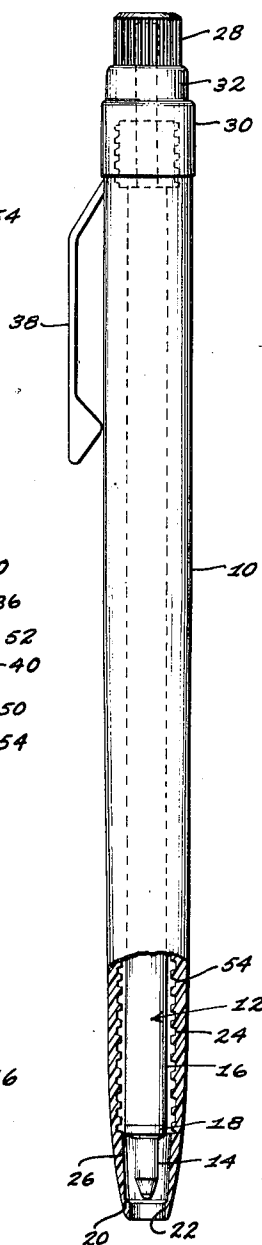


Fig. 2

INVENTOR.
CHARLES K. LOVEJOY
BY
Parrott & Richards
ATTORNEYS

1

2,778,337

RETRACTABLE BALL PEN

Charles K. Lovejoy, Atlanta, Ga., assignor to Scripto, Inc.,
a corporation of Georgia

Application October 19, 1953, Serial No. 386,946

2 Claims. (Cl. 120—42.03)

This invention relates generally to writing instruments of the type incorporating a ball point, and in particular to writing instruments of this sort in which a ball point and reservoir unit is made retractable so that it may be selectively withdrawn entirely within the instrument barrel when not in use or projected from the barrel for writing when desired.

According to the present invention, the ball point and reservoir unit is arranged to seat at the writing end of the barrel when projected so that the ball point element is firmly positioned for writing, while the unit is otherwise disposed freely within the barrel for shifting readily between retracted and projected positions. By this arrangement, the use of very simple shifting or retracting mechanisms is made possible and practicable. Also, this arrangement of the present invention allows the advantageous use of reservoirs formed of flexible plastic material in the ball point units, as is explained in further detail below in connection with the accompanying drawings, in which:

Fig. 1 is a vertical section of a retractable ball pen embodying the present invention, in which the ball point and reservoir unit is shown in projected position;

Fig. 2 is an elevation of the ball pen shown in Fig. 1, with the writing end portion of the barrel in section to illustrate the disposition of the ball point and reservoir unit when retracted;

Fig. 3 is a transverse section taken substantially on the line 3—3 in Fig. 1;

Fig. 4 is a transverse section taken substantially on the line 4—4 in Fig. 1; and

Fig. 5 is a transverse section taken substantially on the line 5—5 in Fig. 1.

The embodiment of the present invention illustrated in the drawings comprises a barrel 10 housing a ball point and reservoir unit designated generally by the reference numeral 12. This unit 12 is formed of a ball point element 14, and a reservoir 16 which is tubular and has the ball point element 14 press fitted within its forward end. The ball point element 14 is formed with an enlargement as at 18 adjacent the forward end of the reservoir 16, which enlargement 18 serves to limit the press fitted depth of the element 14 within the forward end of the reservoir 16, and also cooperates with the barrel 10 for positioning the ball point element 14 properly when projected for writing.

For this latter purpose, the barrel 10 is formed adjacent its writing end with an inwardly facing annular shoulder 20 providing an abutment or annular seat for the ball point enlargement 18 at the projected position of the ball point and reservoir unit 12. As a result, the barrel shoulder 20 provides a positioning seat on which the enlargement 18 is bottomed to hold the ball point element 14 firmly in alignment with respect to the barrel when it is projected for writing. Preferably, the barrel shoulder 20 is tapered toward the writing end of the barrel 10, as shown in the drawings, and the ball point enlargement 18 is formed with a corresponding taper at its

2

abutting face for centering and firmly seating the enlargement 18 on the shoulder 20.

Also, it should be noted that the barrel shoulder 20 forms a step between a terminal writing end bore 22 and a main bore 24 in the barrel 10, and that the main barrel bore 24 may be advantageously tapered inwardly as at 26 adjacent the barrel shoulder 20 to a diameter closely approximating the enlarged diameter of the ball point element at 18 for guiding this enlargement 18 into centered abutting relation with the barrel shoulder 20. Otherwise, however, it will be seen that the ball point and reservoir unit 12 may be disposed with a substantial spacing within the barrel bores 22 and 24 for shifting freely between retracted and projected positions.

Means for shifting the ball point and reservoir unit 12 between retracted and projected positions is shown in the drawings as comprising an operating cap 28 rotatably disposed at the rear end of the barrel 10 by means of an assembly sleeve 30; that is necked in at 32 in retaining relation with respect to an outwardly extending flange portion 34 at the bottom of operating cap 28; and that is fixed over the rear end of barrel 10 and over a mounting band 36 for a pocket clip 38 by dimpling as at 40 within an assembly groove 42 provided for the pocket clip mounting band 36. The operating cap 28 is suitably formed with an air vent 44 through its top face, and is formed internally with four longitudinal ribs 46 defining crossed slots, as seen in Fig. 3, in either of which slots a key shank 48 may be slidably received and engaged to turn with the operating cap 28, the remaining portion of the other crossed slot serving to maintain free communication from the main barrel bore 24 through the operating cap 28 to its air vent 44.

The key shank 48 forms an upwardly extending portion of a propelling member 50 for a screw type feed mechanism forming the shifting means by which the ball point and reservoir unit 12 is manipulated between retracted and projected positions. The propelling member 50 is threaded at its extending faces as at 52 (compare Figs. 1 and 4) to engage feed screw threads 54 formed internally in the barrel 10, so that turning of the operating cap 28 in one direction or the other results in corresponding movement of the propelling member 50 forwardly or rearwardly in the pen barrel 10.

The propelling member 50 is further formed with a forwardly projecting clutch shank 56 that is press fitted within the rear end of the reservoir 16, so that the ball point and reservoir unit 12 is engaged to follow the movement of the propelling member 50 and may thereby be shifted between retracted and projected positions with respect to the barrel 10 at will. It should be further noted at this point that the clutch shank 56 is formed with a cross section, as shown in Fig. 5, that does not fit the bore of the reservoir 16 continuously, and is further formed with a laterally extending lug 58 (see Fig. 1) by which the rear end of the reservoir 16 is spaced from the propelling member 50, by which arrangement plugging of the rear end of the reservoir 16 is avoided to leave the reservoir 16 vented to the atmosphere.

Another important feature of the present invention is that the feed screw threads 54 provided in the main barrel bore 24 for the ball point and reservoir unit shifting means, and which are needed only adjacent the rear end of the barrel 10 for that purpose, are nevertheless extended throughout a major portion of the length of the barrel 10 and thereby provide means for laterally supporting a reservoir 16 formed of flexible plastic material. A reservoir of flexible plastic material, such as polyethylene, offers a number of substantial advantages in a ball pen. In the first place, such plastic materials are characteristically transparent, and thereby afford visibility of the ink supply therein, in contrast with the more

commonly used metal ink tubes. Also, the flexible plastic materials afford substantial manufacturing advantages, such as in making the assembly press fits with the ball point element 14 and the clutch shank 56, and they are in general stronger and more serviceable than rigid plastic materials and have better resistance to the corrosive action of the ball point ink materials.

The difficulty with using a flexible plastic material for the reservoir in a retractable ball pen is that it will not normally support the ball point element adequately when projected for writing. According to the present invention, however, this difficulty is obviated first by arranging the ball point and reservoir unit 12 with the enlargement 18 to bottom on the writing end barrel shoulder 20 at projected position, and secondly, by forming the barrel 10 with internal ribbing to support a reservoir 16 formed of flexible plastic material against undue bending, through extension of the feed screw threads 54 as already noted above. This internal ribbing formed in the barrel 10 by extension of the feed screw threads 54 also results in allowing the use of a relatively thin walled barrel 10, in which the barrel walls proper are no thicker than would normally be practicable and desirable, but which nevertheless provide an effective lateral supporting thickness in relation to the reservoir 16 by reason of the ribbing.

It will be recognized that if the reservoir 16 were not afforded adequate lateral support by the barrel 10, the action of the rearwardly disposed shifting means would be mainly to bend a flexible plastic reservoir 16 as soon as it bottomed on the forward barrel shoulder 20, and this could result in cocking the projected ball point element 14 undesirably and making it impossible to seat the element 14 properly at the barrel shoulder 20. By extending the feed screw threads 54, however, the barrel 10 may be arranged in an entirely practical manner for affording the necessary lateral support for the reservoir 16 and thereby obtain an action for the ball point element 14 just as though a rigid reservoir 16 were used. The extension of the feed screw threads 54 through the barrel 10 for this purpose is illustrated in the drawings as being the most convenient and advantageous arrangement in combination with a screw type feed mechanism such as is illustrated, but the barrel 10 might be otherwise internally ribbed or configured for the same purpose, as with longitudinal ribs such as are disclosed in co-pending application Serial No. 374,395, filed August 14 1953, particularly if it were desired to use some other type of retracting mechanism.

The present invention has been described in detail above for purposes of illustration only and is not intended to be limited by this description or otherwise except as defined in the appended claims.

I claim:

1. A retractable ball pen comprising a tubular barrel,

a ball point and reservoir unit housed within said barrel for shifting relative to said barrel between retracted and projected positions, the ball point element of said unit being press fitted within the forward end of said reservoir and formed with an enlargement adjacent said forward end for limiting the press fitted depth of said ball point element and cooperating with said barrel for positioning said ball point element when projected for writing, said barrel being formed adjacent its writing end with an inwardly facing annular shoulder providing an annular seat for the ball point enlargement at the projected position of said ball point and reservoir unit and positioning said ball point element firmly in alignment with the barrel when projected for writing, the reservoir of said unit being formed of an easily bendable plastic material having insufficient stability itself for adequately supporting the ball point element when projected for writing, said tubular barrel being relatively thin walled and internally ribbed for a major portion of its length to support the reservoir and limit the bending thereof so as to prevent undue cocking of the ball point element and assuring proper seating of the ball point element at the barrel shoulder when projected for writing, and feed means for shifting said ball point and reservoir unit between retracted and projected positions having a relatively rigid screw type propelling member engaging screw threads formed in said barrel rearwardly of said internally ribbed length and formed with a forwardly projecting clutch shank that is press fitted within the rear end of said reservoir, said ball point and reservoir unit following the movement of said propelling member whereby operation of said feed means freely shifts said ball point and reservoir unit between retracted and projected positions and locks said ball point and reservoir unit in the projected position for writing.

2. A retractable ball pen as defined in claim 1 and further characterized in that the internally ribbed length of said barrel is formed by a continuation therein of the screw threads formed in said barrel for engaging said propelling member.

References Cited in the file of this patent

UNITED STATES PATENTS

2,427,068	Randolph	Sept. 9, 1947
2,565,556	Gruber	Aug. 28, 1951
2,565,601	Fischer	Aug. 28, 1951
2,595,001	Sams et al.	Apr. 29, 1952

FOREIGN PATENTS

181,624	Great Britain	June 22, 1922
641,595	Great Britain	Aug. 16, 1950
976,412	France	Oct. 25, 1950