Nov. 29, 1966 N. PORITZ 3,288,116

MULTI-COLOR ADAPTED BALL POINT PEN

Filed July 14, 1964 2 Sheets-Sheet 1

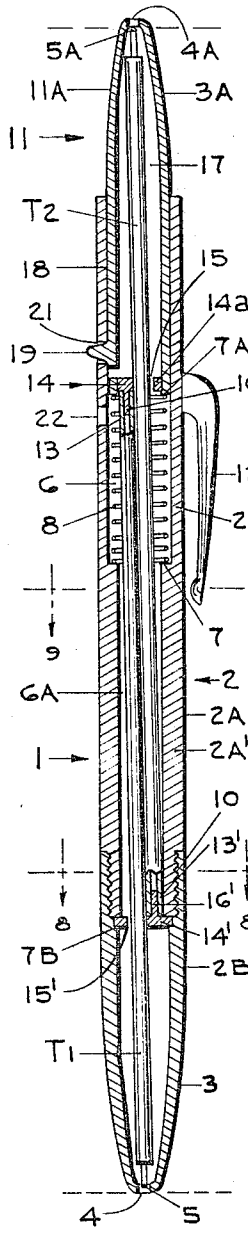

Fig 1

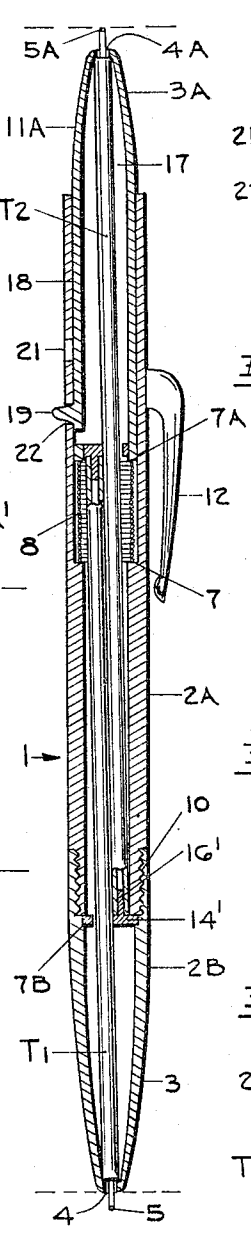

Fig 2

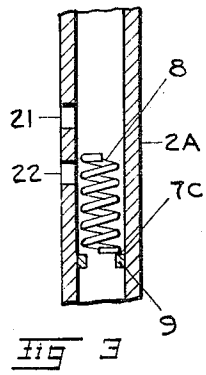

Fig 3

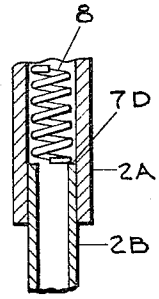

Fig 4

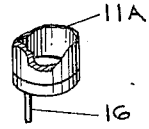

Fig 5

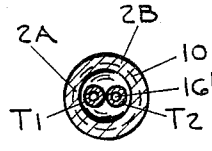

Fig 8

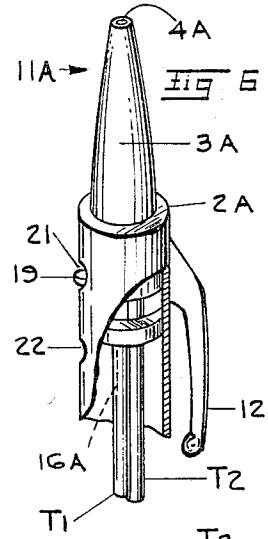

Fig 6

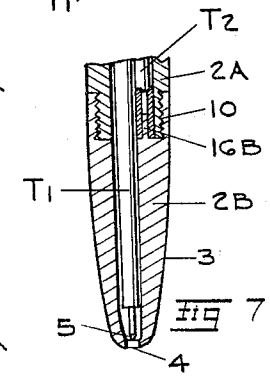

Fig 7

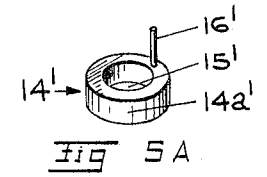

Fig 5A

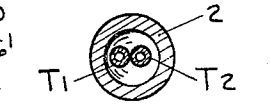

Fig 9

INVENTOR.

Nathan Poritz

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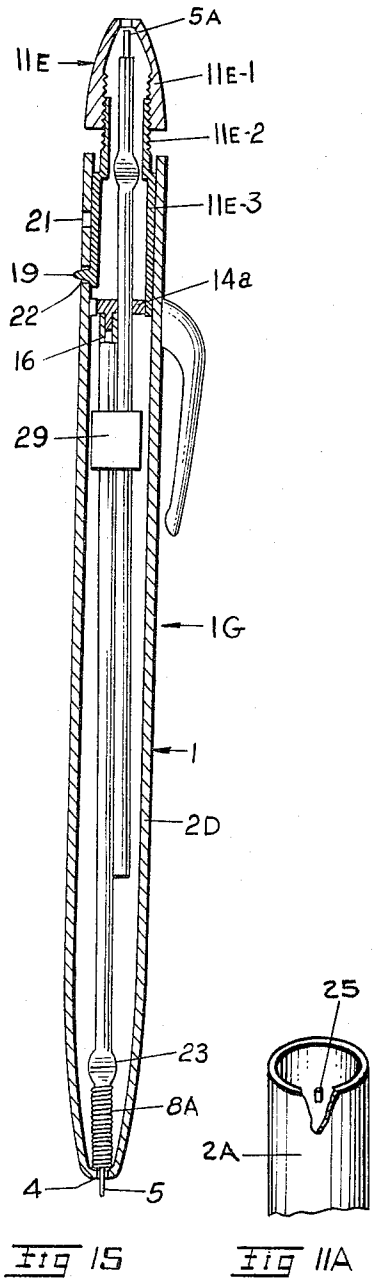

Fig 15

Fig 11A

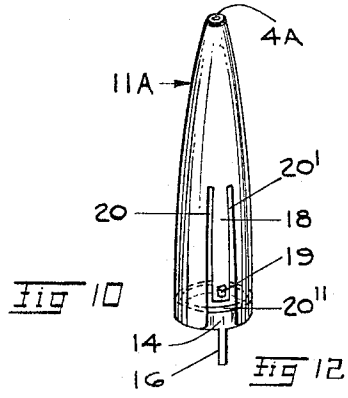

Fig 10

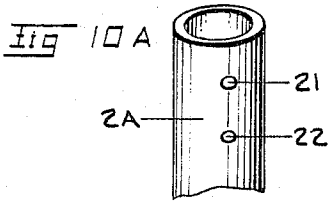

Fig 10A

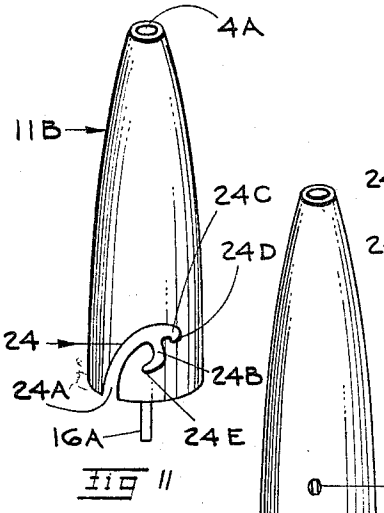

Fig 11

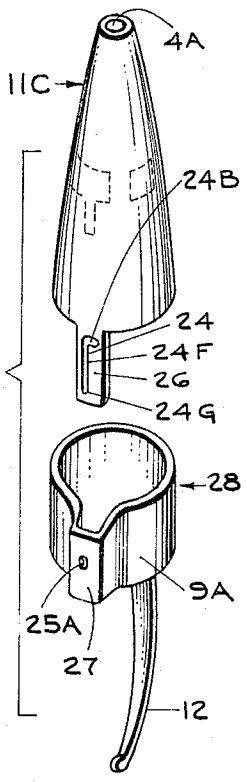

Fig 12

Fig 14

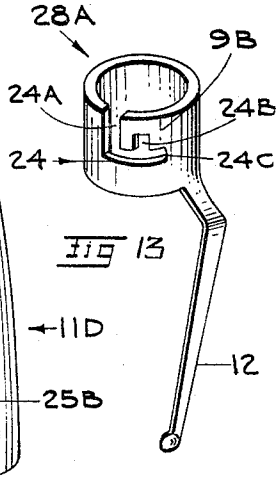

Fig 13

INVENTOR.

Nathan Poritz

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MULTI-COLOR ADAPTED BALL POINT PEN

Nathan Poritz, 236 E. 23rd St., Brooklyn, N.Y.

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10 Claims. (Cl. 120—42.1)

This invention relates generally to a ball point pen and more particularly to a pen in which plural ball point ink tubes are housed, within the barrel of the pen, with means for projecting and retracting the writing points into and out of writing position.

My prior invention, U.S. Patent 2,882,859, provided for a ball point pen having a single cap plunger holding a plurality of ball point refills as spares and in which pen each of these spares was retained within the barrel by extended arm means, said arm means being part of a single cap plunger.

However, in operation the use of the spares contained in the barrel is delayed. In general, before use, they are required to stay in the barrel waiting until such time that the ink of the writing ball point tube has been exhausted. Then, additionally, steps of removing the depleted tube and reassembly with a spare was required. Thus, there is an obstacle to immediate or quick use of the spare.

My present improvement for which patent protection is sought consists mainly in separating the arm means and combining the said separated means together with but a single spring contained within the barrel so as to acquire the independent functioning of each ink tube, and to secure the immediate or quicker use of the spare or spares in the barrel without the replacement steps required in my prior invention.

The method mainly used in this invention, briefly considered, comprises the cooperative use of a single element, a spring, and the principle of juxtaposition with respect to the holding parts. Explained in a little more detail this principle as used here requires placing the separated arms or holding means in parallel arrangement or in diagonal opposite positions with respect to each other or their placement in back to back arrangement. In this manner the corresponding multi-refills contained in the pen are caused to operate separately from each other, in quick succession, and without the disadvantage or need to remove them from the barrel and further to continue operating in this manner until final exhaustion of ink.

A primary object of the present invention consists in presenting a novel means of ball point construction which will enable easy and speedy use of separate tube writing, and which will reduce time and effort getting the writing points into position for writing.

Another object of the present invention is to provide a form of ball point pen in which each of the points of the separate ink tubes is exposed at the opposite ends of the pen so that either end, say, one end red and the other blue in color, may, by a simple quick flick of the pen, be quickly used for separate color writing; and in which both points simultaneously project and subsequently, simultaneously, both points retract with but a single operation.

Another object of the invention is to provide a pen construction of the above character having improved means for locking the pen in projected writing position and for positively maintaining the point against accidental release during the use of the pen in writing.

The aforesaid objects of the present invention, and other objects which will become apparent as the description proceeds, are achieved by providing a ball point pen comprising a barrel, said barrel having an aperture in the lower end thereof, an ink tube extending longitudinally within the barrel and having the lower ball point end located in registry with the aperture at the lower end of said barrel, a slidable cap disposed at the upper end of

said barrel, another ink tube extending alongside of the first named ink tube and having its upper ball point end located in registry with the aperture located in the upper end of said slidable cap, said slidable cap longitudinally movable with respect to the upper end of the barrel wherein the downward movement of the cap exposes the writing ball point of the second named ink tube through the aperture at the top end of the slidable cap and wherein it also simultaneously projects the writing ball point of the first named tube through the aperture at the bottom end of the barrel, said slidable cap being provided with a member for the support of the first named ink tube substantially in vertical arrangement, and means for limiting the upward movement of the said slidable cap and for releasably locking the cap in and from the position of projection and retraction, said slidable cap extending outwardly of the barrel capable of receiving finger pressure thereby projecting the ball points through their respective apertures.

Other objects and advantages will be apparent from the following detailed description of several preferred embodiments of the invention, reference being made to the accompanying drawings, in which:

FIGURE 1 is a longitudinal vertical sectional view of a ball point pen embodying one form of my invention, the writing ball points being shown in retracted position,

FIGURE 2 is a longitudinal vertical sectional view of the same pen as in FIGURE 1 but with the writing ball point being shown in projected position,

FIGURE 3 is a vertical sectional view of the upper barrel showing another form of shoulder support for a wide spring,

FIGURE 4 is a vertical sectional view of a shoulder support for a wide spring formed by two barrel sections,

FIGURE 5 is a partial perspective view of a cap structure showing an arm depending therefrom,

FIGURE 5A is a perspective view of a disc unit with an upstanding arm and sleeve,

FIGURE 6 is a cut away perspective view of the upper barrel and cap unit with integral arm,

FIGURE 7 is a longitudinal vertical sectional view of the lower barrel with integral upstanding arm,

FIGURE 8 is a cross sectional view on line 8—8 of FIGURE 1,

FIGURE 9 is a cross sectional view on line 9—9 of FIGURE 1,

FIGURE 10 is a perspective view of cap unit showing disc joined at the bottom of the cap,

FIGURE 10A is a perspective view of the upper barrel showing upper and lower aligned holes,

FIGURE 11 is a perspective view of cap structure showing bayonet slot component,

FIGURE 11A is a perspective view of upper barrel cut away to show pinlike indentation projecting therefrom inwardly,

FIGURE 12 is a spread perspective view of the modified cap structure clip and ring unit,

FIGURE 13, is a perspective view of a modified clip and ring unit showing a bayonet slot,

FIGURE 14 is a perspective view of a cap unit with indentation projecting inwardly threfrom, and

FIGURE 15 is a longitudinal vertical sectional view of a modified ball point pen.

Referring in detail to the drawings as shown in FIGURES 1 and 2, a ball point pen embodying one form of the invention is shown and designated at **1**. The pen **1** comprises, generally, a sectional barrel **2** including an upper longitudinal section **2A** and a lower longitudinal section **2B**; the said lower section **2B** being tapered as indicated by the reference numeral **3** and is provided at its tip with an aperture **4** for retraction and projection of the writing point **5** of the lower ink tube **T–1**. In

the upper section of the barrel 2A the wall thickness 2A' at the top of the section 2A is of lesser dimension than that of the remaining portion 2A'' of the upper section 2A of the barrel. Hence, the inside diameter of the bore, indicated by the reference numeral 6, is necessarily greater in dimension than the bore of the remaining barrel, indicated generally by the reference numeral 6A.

The object of this type of barrel construction with reference to the difference in wall thickness is (a) to form a shoulder, shown in this drawing at 7, the purpose of which is to provide a support for a wide spring 8 to rest upon or react against, and also, (b) to provide the additional physical space within the upper barrel for occupancy and movement by the said wide spring 8, also (c) to take in consideration the amount of barrel space required by the adjacent multi-tubular refills contained within the spring. It should be noted however that the invention may operate without the use of the spring 8 and this will become apparent as the description proceeds.

Other ways to provide for a shoulder to support a wide spring within the barrel are illustrated in FIGURES 3 and 4. In FIGURE 3 a shoulder 7*c* is provided within the upper barrel, the wall of which is of uniform thickness, by means of a ring 9 which is inserted and tightly fitted into said barrel or formed as part of said upper barrel. The wide spring 8 then rests upon the said shoulder 7*c*, in the same snug manner as shown in the shoulder 7 of FIGURES 1 and 2. In FIGURE 4 the longitudinal sectional barrel 2 has at least two parts, the lower one of which 2B is inserted and fitted tightly into an upper barrel section 2A. In this construction the top of the barrel wall of the lower section 2B forms a shoulder 7D on which the wide spring 8 rests, in the same manner as in the FIGURES 1, 2 and 3.

Referring now to the upper and lower barrel sections 2A and 2B of FIGURE 1, these may be either fitted together or threadedly connected. In the drawing threaded connection 10 permits separation when necessary to replace the used up ink tubes.

Metal or plastic or other suitable substitute material may be used to construct the barrel.

Generally closing the opposite or upper end of the barrel and forming a slidable extension thereof is a tubular cap unit 11. With respect, specifically to the exact type of cap structure used, cap structure 11A, as shown in FIGURE 1 is tapered, shown as 3A, and contains an aperture 4A at its top end through which the ball point 5A of refill T–2 projects and retracts.

A clip 12 of metal or otherwise, is fastened to the upper end of the barrel section. Disposed inside the barrel are multi-ink tubes, T–1 and T–2; each of conventional size and material and optionally formed minus abutments as ordinarily required on ink tubes.

Each of these cartridges T–1 and T-2 may be provided with venting means (not shown) to promote the proper flow of ink, as is well known to those skilled in the art.

Tube T-1 comprises a hollow cylinder 13 containing a supply of plastic ink and at its writing end is provided with a ball point 5. In FIGURE 1, said ball point 5 is shown in retracted position within the aperture 4 of the tapered end 3 of the lower barrel section 2B. In FIGURE 2 the ball point 5 is shown in its projected position extending beyond the aperture 4.

Referring again to the coil spring 8, located in the upper part of the barrel 1B and supported by the shoulder 7, said coil spring functions to yieldingly support the overlying cap structure 11A which is slidable within the top portion 2A' of the barrel section 2A. The basic spring action may be described as follows. The top portion of the wide spring 8 and the bottom part of the said slidable cap structure 11A maintain constant contact at all times so that a downward force exerted upon the cap structure 11A is transferred to the spring 8 resulting in the compression of said spring into a reduced space as shown

in FIGURE 2. Subsequent release of said compression force in the spring results in expansion of the said spring 8 compelling an upward movement of the cap structure 11A taking with it tube T–1 which is joined suitably to said cap 11A. For the purpose of making the connection of tube to cap, a perforated disc unit 14—also shown in perspective in FIGURE 5—comprising a disc 14*a*, a central hole or sleeve 15, an extending arm 16 is fastened to the bottom of the tubular structure 11A. Said arm 16 depends from the under surface of the disc 14*a* and extends into the open end of tube T–1 thereby frictionally supporting said tube. The arm extension, however, may be formed as an integral part of the cap, as indicated at 16A of FIGURE 6.

Another similar disc unit 14', shown in perspective in FIGURE 5A, includes a disc 14*a'*, central hole or sleeve 15', and an upstanding arm 16. The disc 14' may be seated fixedly on the shoulder 7B formed on the inner surface of the lower barrel 2B adjacent the threaded barrel connection 10. Generally, the said disc unit 14' is secured to the lower barrel 2B by a tight fit or by adhesive or any other suitable means. In FIGURE 1 clamping down the disc 14' against the shoulder 7B is the method selected, the disc 14' is dropped onto the shoulder 7B of the barrel 2B and subsequently clamped down into a fixed immoveable position by the bottom part of the threaded portion 10 of the upper barrel 2A.

Alternatively, the upstanding arm 16', may be formed as an integral part of the lower barrel section 2B as indicated at 16B in FIGURE 7.

A second ink tube T–2 is disposed in a side by side, substantially contiguous relation, along side the ink tube T–1. Said ink tube T–2 is frictionally joined to disc 14' by means of the upstanding arm extension 16'. This union of arm 16' and tube T–2 accomplishes two things—(1) the arm tightly grips the open end of the tube T–2 firmly retaining it and with direct finger pressure applied against it, yieldingly releases the tube T–2, (2) correspondingly, by virtue of its hold the arm 16' points the writing end 5A of the tube T–2 in a direction directly opposite to that of the writing end 5 of tube T–1.

The upper part of tube T–2 passes through the central hole 15 of disc 14 and then upwardly through the central bore 17 of the cap unit 11A ending up with the writing ball point 5A normally positioned just inside the aperture end 4A of the cap 3A.

The cap 11A contains a spring finger 18, which is also shown in a perspective view in FIGURE 10. This spring finger 18 is formed by two parallel longitudinal slits 20, 20' intersecting at right angles a third slit or lower edge 20''. Said spring finger 18 contains a short protuberance 19 radiating from the bottom free end thereof. The protuberance 19 is tapered downwardly and upwardly to coact with an upper pair of aligned holes, 21 and 22 located close to the top of the barrel section 2A. Perspective drawings, FIGURE 10 and FIGURE 10A also show this. These drawings illustrate the type of cap that is slidable within the barrel. In other alternative cap forms, as shown in FIGURES 12 and 14, the cap structure may be slidable outside of the barrel.

Normally the cap structure 11A extends outwardly of the barrel with the protuberance 19 on the spring finger 18 engaged in the upper hole 21 of the barrel 2A. The writing ball points 5 and 5A are then in retraction inside the tapered end 3A of the cap structure 11A. In order to project the writing potint, the cap structure 11A is manually pressed downwardly—thereby forcing the ink tube T–1 downward by reason of its connection with the disc unit 14. The ink tube T–1 continues in the downward direction until the protuberance 19 on the spring finger 18 snaps into the lower aligned hole 22 of the barrel section 2A, at which time the writing ball point 5 is then outside of the barrel and in writing position as shown in FIGURE 2.

At the same time as downward pressure on the slidable

cap structure carries the cap further downward within the barrel, the cap position within the barrel changes from that in FIGURE 1 to that of FIGURE 2. This results in the clearance and exposure of the upper writing ball point 5A of tube T–2, and thus both writing points 5 and 5A, at both ends, simultaneously, are outside of the barrel in ready writing position.

In order to retract the parts it is merely necessary to release the spring pressure. This is quickly accomplished by pressing the proturberance button 19 located now in the locked position of aligned hole 22.

In FIGURE 11 is illustrated another modification 11B, with respect to cap structures in that another means besides a spring finger plus protuberance is provided for locking the cap structure against projection and retraction and for releasing said cap altogether from the barrel. Said slidable cap 11B may be adapted for slidable movement within the top part of the upper barrel section 2A and is provided with a bayonet slot, designated generally as 24. This comprises three sections, 24A, 24B, and 24C. Intersecting the bottom edge of cap structure 11B, slot 24A continues diagonally upward curvilinearly around and enters slot 24C located at the end of the turn. Rounding out the end slot 24C is a notch 24D. Located midway is slot 24B which drops vertically down ending in a hooked shaped notch 24E; the purpose of providing notches at the end of the slot being to maintain, securely the projection 25 within the slot.

In order to engage cap and barrel the cap is placed slidably within the barrel 2A then turned until slot 24A engages the fixed projecting means, the pin or pinlike indentation 25 located on the barrel and extending inward beyond the inside wall of the upper barrel section 2A. Continued downward finger pressure on cap 11B against the spring 8A spins the said cap around guidingly until the identation 25 engages slot 24C and notch 24E at the end of central slot 24A and locks against spring pressure. In this part of the action, downward pressure of cap 11B against the spring 8A results in compressing the spring into a smaller space and a corresponding further movement of the cap downward within the barrel into the vacated space. By reason of the arm joined to the cap the lower tube T–1 also moves down into projection.

To retract the pen within the barrel a slight reverse turn of the cap brings indentation 25 directly over the slot 24B at this point the expansion force in the spring acting now against the cap 11B pushes the cap upward bringing indentation 25 into slot 24B where the notch 24D engages the barrel indentation 25 and keeps the cap 11B locked in retraction.

To release the pen altogether from the barrel for refill requirement, a slight push down on the cap brings the indentation 25 into slot 24A and continued turning in the reverse direction releases the cap altogether from the barrel.

In FIGURE 15 the use of adhesive tape as a substitute for arm means in the barrel for holding ink tubes is illustrated. In the pen shown, the barrel comprises a single hollow casing 2D with upper and lower aligned holes 21 and 22, respectively, at the top end thereof. A tubular member 11E is slidably mounted within the barrel, at the top thereof extending outwardly of the barrel. The tubular member 11E is formed with an externally threaded neck 11E–2 and with a spring finger and protuberance 19 carried on the bottom free end of the spring finger, shown in projected position in the lower aligned hole 22 in the barrel. An internally threaded tapered cap 11E–1 is screwed onto the top end of the neck 11E–2. Disc 14*a* is fastened to the bottom of section 11E–3 of the cap 11E and depending downward from the disc 14*a* arm 16 extends within the top opening of tube T–3. Inside the barrel tube T–3 and T–4 are disposed side by side in substantially vertical arrangement centrally of the barrel and are held together by a strip of adhesive tape

29 encircled therearound. Tube T–3 is disposed with its ball point 5 projecting through the aperture 4 at the bottom end of the barrel, and tube T–4 has its ball point 5A projecting within the aperture 4A at the top of cap 11E–1.

In use cap 11E–1 is screwed down along the neck 11E–2 until the restricted top end thereof contacts the top end of ink tube T–4. This downward movement of the cap exposes the ball point 5A of ink tube T–4 and continued downward movement forces ink tube T–4 downwardly. Ink tube T–3, which is connected to ink tube T–4 by means of tape 29, thus is carried along and the ball point 5 of tube T–3 is moved into projected position outside of the barrel. Both ball points are now in writing position. Manual downward pressure on the tubular member 11E–1 having moved the protuberance 19 out of hole 21 into hole 22 holds the tubes in operative position. When pressure on the top end of T–4 is released by the upward movement of the cap 11E–1 which occurs when finger pressure is applied to the protuberance 19 in hole 22, the coil spring 8A retracts the parts to inoperative position.

We have hitherto illustrated forms of the invention in which a single spring in the barrel is combined with means for holding multi-ink tubes for operative function where the said means are located in different parts of the barrel.

In FIGURE 1 and others the holding means are arranged in positions that are diagonally opposite to each other with the corresponding tubes pointing in opposite directions.

In FIGURE 1 the separated arms holding tubes T–1 and T–2, designated as 16 and 16′ are located in the barrel in diagonally opposite positions thus pointing both tubes in opposite directions.

It will be recognized by those skilled in the art that the objects of the present invention have been achieved by providing a pen which may simultaneously project and/or retract two writing points, one from each end of a barrel and this may be accomplished with or without an internal spring.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

I claim:

1. A ball point pen comprising a hollow barrel having an aperture in its lower end, a first ink tube disposed within said hollow barrel being provided with a lower ball point, said lower ball point being disposed in registry with said aperture in the lower end of said hollow barrel, a moveable cap having an aperture in its upper end disposed on the upper end of said hollow barrel, a second ink tube disposed within said hollow barrel and alongside said first ink tube being provided with an upper ball point, said upper ball point of said second ink tube being in registery with the aperture in said moveable cap, said moveable cap being longitudinally moveable on said barrel whereby the downward movement of the cap exposes the upper ball point of said second ink tube through the aperture in the upper end of said moveable cap and the movement of said moveable cap further projects the lower ball point end of said first ink tube through the aperture in the lower end of said hollow barrel, at least one member disposed within said hollow barrel for holding at least one of said ink tubes longitudinally within said hollow barrel, and means disposed on said moveable cap for releasably locking said moveable cap in and from the positions of projection and retraction of the ball points through the apertures.

2. A ball point pen according to claim 1 wherein said at least one member comprises a disc unit.

3. A ball point pen according to claim 2 wherein said moveable cap communicates with at least one of said

disc units for simultaneously projecting said upper and lower ball points through their respective apertures.

4. A ball point pen according to claim **3** wherein said disc unit is provided with an arm for connection to at least one of said first and second ink tubes.

5. A ball point pen according to claim **4** wherein an upper disc unit is disposed in the upper portion of said hollow barrel and is connected to said first ink tube, and a lower disc unit is disposed in the lower portion of said barrel and is connected to said second ink tube.

6. A ball point pen according to claim **5** wherein said moveable cap is adapted to slide within the upper end of said hollow barrel, said moveable cap being provided with a protuberance for releasable insertion into a pair of aligned holes provided in said hollow barrel for releasably locking said moveable cap in and from the positions of projection and retraction of the ball point through the apertures.

7. A ball point pen according to claim **6** wherein said moveable cap is disposed above said upper disc unit, said hollow barrel being provided with an internal shoulder, a spring disposed between said upper disc unit and said shoulder whereby the downward movement of said moveable cap will simultaneously project said first and second ink tube ball points through their respective apertures.

8. A ball point pen according to claim **1** wherein said moveable cap is threadedly mounted on the upper end of said hollow barrel.

9. A ball point pen according to claim **8** wherein said at least one member comprises a disc unit.

10. A ball point pen according to claim **8** wherein said moveable cap is threadedly mounted on the upper end of said hollow barrel in communication with one of said first and second ink tubes, said moveable cap when threaded downwardly projects said upper ball point of said second ink tube through said aperture in said moveable cap and further downward threading of said moveable cap thereafter causes said lower ball point to be projected through said aperture in the lower end of said hollow barrel.

References Cited by the Examiner

UNITED STATES PATENTS

2,603,186	7/1952	Fischer	120—42.03
3,079,894	3/1963	Johmann	120—42.1
3,143,101	8/1964	Hechtle	120—42.13
3,158,138	11/1964	Bross	120—42.13 X

FOREIGN PATENTS

971,843	8/1950	France.
1,091,233	10/1954	France.
1,216,481	11/1959	France.
783,208	9/1957	Great Britain.
542,058	2/1955	Italy.
568,454	10/1957	Italy.

LAWRENCE CHARLES, *Primary Examiner.*