United States Patent [19]

Poritz

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[45] **Apr. 2, 1974**

[54] **BALL POINT PEN STRUCTURE**

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[22] Filed: **Mar. 15, 1973**

[21] Appl. No.: **341,499**

[52] **U.S. Cl.** **401/29,** 401/112

[51] **Int. Cl.** **B43k 27/04,** B43k 27/12

[58] **Field of Search** 401/29–35

[56] **References Cited**

UNITED STATES PATENTS

3,158,138	11/1964	Bross	401/29
3,288,116	11/1966	Poritz	401/29

Primary Examiner—Lawrence Charles

Attorney, Agent, or Firm—Natter & Natter

[57] **ABSTRACT**

A ball point pen body includes a pair of oppositely disposed ink cartridges. An aperture is formed at each end of the body and segments of the body are forced together to simultaneously project a ball point end of each cartridge through one of the apertures. The base end of each ink cartridge is fixed to a separate body segment by engagement with a self seating split ring retainer. Relative movement of the body segments toward or away from each other is guided by a track formed in a telescoping sleeve which frictionally holds the body segments in their selected relative positions with the ball points either projecting from the apertures for writing or retracted into the body.

12 Claims, 12 Drawing Figures

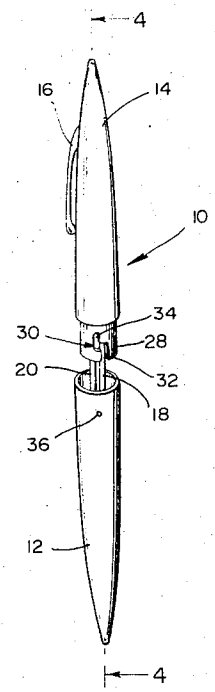


FIG. 1

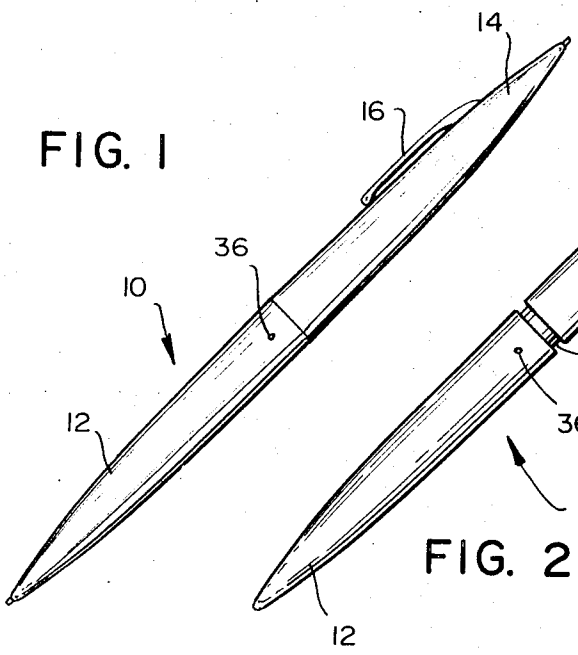


FIG. 2

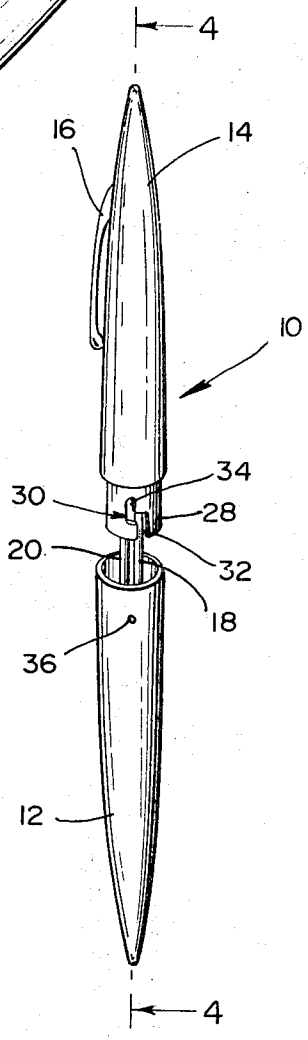


FIG. 3

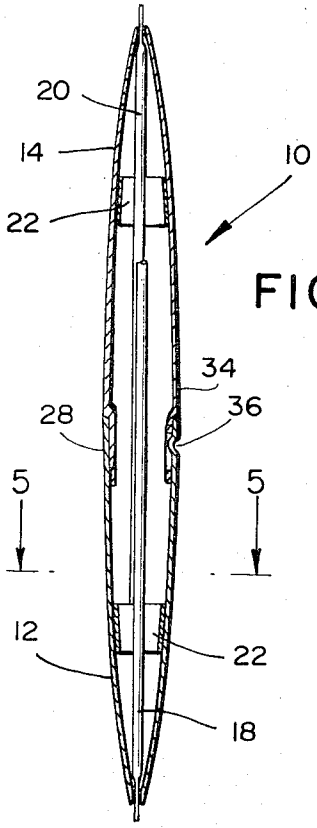


FIG. 4

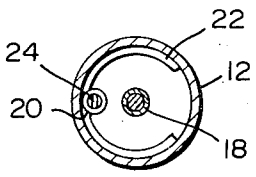


FIG. 5

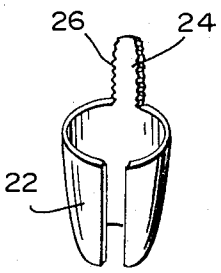


FIG. 6

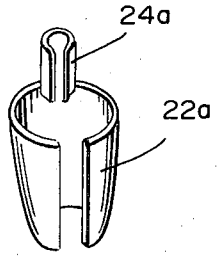


FIG. 7

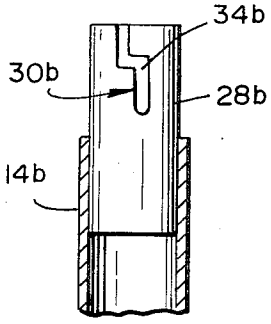


FIG. 8

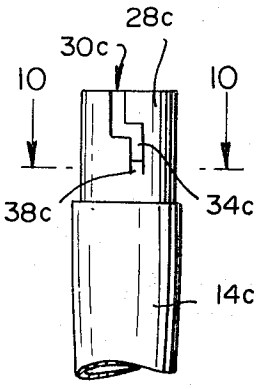


FIG. 9

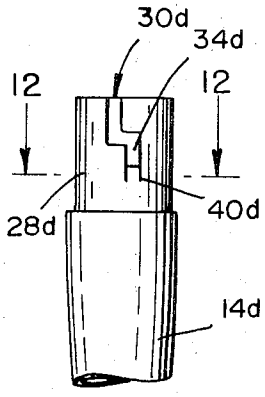


FIG. 11

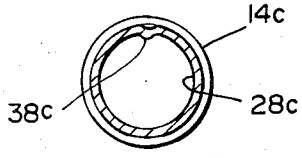


FIG. 10

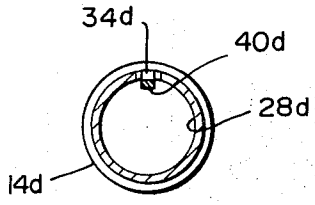


FIG. 12

BALL POINT PEN STRUCTURE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates generally to writing implements and more specifically to mechanisms for extending a ball point tip to a writing position.

2. Brief Description of the Prior Art

Ball point pen structures designed for carrying multiple writing points have been proposed heretofore. For the most part, these devices have not met with commercial acceptance because of a variety of factors. Usually the internal pen structures were extremely complicated, employing a plurality of springs, tracks, and/or threaded mechanisms for positioning a ball point writing tip in a writing position. In some instances, the pen bodies were excessively thick to accommodate multiple ink cartridges. An additional deterrent to widespread commercialization of several of these proposed pens was the fact that they were so dimensioned and constructed as to accept but specialized ink refill cartridges. These specialized refill cartridges were generally shorter than the ordinary refill cartridge and presented a more limited supply of writing liquid than conventional cartridges. An example of such proposed writing implement is illustrated U. S. Pat. No. 3,158,138.

Several basic improvements over the pen structures used previously were illustrated in my previous patent, U. S. Pat. No. 3,288,116, dated Nov. 29, 1966. In this patent, a double ended ball point pen utilizing two standard ink refill cartridges was disclosed. Some drawbacks such as the multiplicity of component parts required rendered even this pen difficult to mass produce at competitive market prices.

SUMMARY OF THE INVENTION

The present invention is directed to substantial improvements over the double ended ball point pen disclosed in my previous U.S. Pat. No. 3,228,116. In compendium, the present invention relates to a pen having a body formed of two segments, i.e. a barrel and a cap. The interior of the pen body houses a pair of oppositely disposed ink cartridges. Each ink cartridge is fixedly secured to one body segment and its ball point end is selectively extendible through an aperture formed in the other body segment by moving the segments toward each other.

To guide the relative movement of the segments, a telescoping sleeve projects from the cap into the barrel and a track, formed in the sleeve, is engaged by a protuberance extending inwardly from the barrel. The sleeve, frictionally engaging the barrel, retains the barrel and cap in juxtaposition against the bias of forces exerted upon the ball point writing tip selected for writing.

From the foregoing compendium, it will be appreciated that among the objects of the present invention is the provision of a ball point pen structure of the general character described which is not subject to any of the aforementioned disadvantages.

A further object of the present invention is to provide a ball point pen structure of the general character described which is low in cost and well suited for economical mass production fabrication techniques.

Another object of the present invention is to provide a ball point pen structure wherein a ball point ink cartridge is secured in a portion of the pen body by being engaged over a self seating split ring retainer.

Yet a further object of the present invention is to provide a ball point pen structure of the general character described wherein two ball points may be simultaneously extended to or retracted from writing positions with but a modicum of component parts.

A still further object of the present invention is to provide a writing implement wherein a tipped cartridge is fixed to one body segment and with the writing tip of the cartridge extendible through or retractable from an aperture in another body segment by movement of the segments relative to one another.

Other objects of the invention in part will be apparent and in part will be pointed out hereinafter.

With these ends in view, the invention finds embodiments in certain combinations of elements and arrangements of parts by which the said objects and certain other objects are hereinafter attained, all as fully described with reference to the accompanying drawings and the scope of which is more particularly pointed out and indicated in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings in which are shown some of the various exemplary embodiments of the invention,

FIG. 1 is an elevational view of a ball point pen constructed in accordance with and embodying the invention and showing the pen in a writing position with a ball point writing tip extending from each end thereof;

FIG. 2 is a further elevation view of the pen similar to that of FIG. 1, but with the ball point tips retracted into the pen body;

FIG. 3 is a partially exploded perspective illustration of the pen showing a barrel and a cap with the cap being spaced from and in registry with the barrel thereby exposing two ball point cartridges carried in the interior of the body;

FIG. 4 is a sectional view through the pen, the same being taken substantially along the line 4—4 of FIG. 1 and showing the interior of the pen body wherein the ink cartridges are housed as well as the engagement between the barrel and a sleeve telescoping from the cap into the barrel to retain the selected positions between the cap and barrel;

FIG. 5 is an enlarged sectional illustration through the pen barrel, the same being taken substantially along line 5—5 of FIG. 4 and showing one of the ink cartridges engaged over a split ring retainer;

FIG. 6 is a perspective illustration of one of the split ring retainers showing a striated post over which the ink cartridge is seated;

FIG. 7 is a perspective illustration of an alternate embodiment of the retainer wherein the post structure is modified;

FIG. 8 is a fragmentary sectional illustration through the cap of an alternate embodiment of the invention wherein the cap is modified by providing a separate sleeve;

FIG. 9 is a fragmentary plan view of a pen cap showing a further alternate embodiment of the invention wherein the sleeve track is of a modified configuration;

FIG. 10 is a sectional view, the same being taken substantially along the line 10—10 of FIG. 9 and through the modified sleeve;

FIG. 11 is a further fragmentary plan view of a pen cap showing another embodiment of the invention wherein the sleeve is further modified; and

FIG. 12 is a sectional view through the modified sleeve, the same being taken substantially along the line 12—12 of FIG. 11.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now in detail to the drawings, the reference numeral 10 denotes generally a ball point pen constructed in accordance with and embodying the invention. The pen includes a body formed of a barrel segment 12 and a mating cap segment 14. It will be appreciated that in accordance with the invention each of the segments includes an aperture at its distal end through which a ball point writing tip may selectively extend. A conventional pocket clip 16 may be provided on the cap.

The pen body houses a pair of standard ball point ink cartridges 18 and 20, each of which includes an ink carrying tube with a conventional ball point writing tip at one end. The cartridges 18, 20 are positioned within the body such that each cartridge is fixed relative to one of the body segments with the ball point tip thereof extendible through the aperture in the other body segment.

In accordance with the invention, guided movement of the body segments, i.e. the barrel 12 and the cap 14, toward or away from each other will either cause both ball point tips to extend from their respective body segments to writing positions or to be retracted into the body to prevent inadvertent marking when not in use, e.g. when carried in one's pocket.

It should be noted that both the barrel 12 and the cap 14 include a sloped inner bore to which a selected ink cartridge is fixed. A novel split ring retainer 22 is utilized in each of the segments to secure the respective cartridge. A typical configuration of the retainer 22 is illustrated in FIG. 6. The retainer is formed of a generally frusto-conical ring with its external dimensions generally approximating the internal tapered bore dimensions of the body segments so that it may be slipped into a body segment and will stop at a position wherein the mating surfaces of the retainer and bore interfere. It should further be appreciated that since the retainer is split, it can be forced into the respective body segment a further distance after initial interference causing the retainer walls to decrease in diameter slightly, narrowing the slit and thereby securing a tight engagement whereby the retainer will not only resist being pushed further into the body segment, but will additionally resist being inadvertently pulled therefrom.

A post 24 extends from the large diameter end of the split retainer to secure an ink cartridge to the retainer 22. It should be noted that the open end of the ink cartridge, i.e. the end opposite the ball point tip, may be forced over the post and, as shown in FIG. 6, a plurality of flukes 26 extending laterally from the post 24 provide a tight and secure engagement between the ink cartridge and the retainer.

Selected movement of the body segments toward or away from one another is guided by a telescoping sleeve having a slotted track. The track is of a configuration such that the body segments can be either pulled apart or forced together from one fixed position to another fixed position with appropriate limit stops formed in the track. For the aforementioned purpose, a sleeve 28, formed in one piece with the cap 14, telescopes into the barrel 12 to retain the body segments in their selected positions (see FIGS. 3 and 4).

From an observation of FIG. 3 it will be appreciated that a track 30, formed in the sleeve 28, may typically include a first zone 32 extending inwardly from the distal edge of the sleeve 28 and along an axis substantially parallel to the cap axis. The track 30 continues from the first zone 32 in a direction perpendicular to the length of the first zone to a second or operating zone 34. It can be further observed from FIG. 3 that when the cap 14 and barrel 12 are secured together to form the composite pen, the first zone 32 of the track 30 is registered with a protuberance 36 which extends inwardly from the barrel 12. The protuberance 36 engages the track 30 to guide relative motion between the cap 14 and barrel 12.

When the protuberance 36 abuts the upper end of the first zone (as viewed in FIG. 3), the body segments are rotated with respect to each other so as to guide the protuberance 36 into the second or operating zone 34 of the track 30. With the protuberance 36 positioned at the lower end of the operating zone 34, the body segments are spaced apart a sufficient distance such that the ball point writing tips of the ink cartridges 18, 20 do not extend through the apertures at the ends of the body segments.

It should also be appreciated that with the protuberance 36 at the lower end of the track operating zone 34, a sufficient area of the barrel 12 between the protuberance 36 and the end of the barrel adjacent the cap 14 is provided to conceal the track 30 in its entirety. Only a slight area of the sleeve 28 is visible between the barrel and the cap as illustrated in FIG. 2. The track operating zone 34, offset from the first zone 32 and being engaged by the protuberance 36, provides a limit stop to prevent the cap 14 from being inadvertently separated when the segments are pulled apart to retract the ball point writing tips.

Because the track 30 is provided in the sleeve 28, the sleeve may be formed with a diameter larger than the internal bore of the barrel segment 12 within which it is seated. Thus, when the sleeve 28 is telescoped into the barrel 12, it is compressed to a smaller diameter, narrowing the track 30, and is tightly engaged in the barrel to prevent inadvertent movement of the barrel 12 relative to the cap 14. The radially outward spring bias of the sleeve 28 serves to retain the cap 14 and barrel 12 fixed in edge abutting end to end contact when the segments are moved to the writing position (shown in FIG. 1) wherein the protuberance 36 is adjacent the upper end of the operating zone 34 of the track 30.

It should be noted that when the pen 10 is used for writing, any forces exerted on the ball point tip selected for writing are transmitted through the ink cartridge to tend to urge the segments apart but normal writing forces transmitted through the ink cartridge are not sufficient to overcome the tight spring bias frictional engagement between the sleeve 28 and the pen barrel 12. The ball point tips are retracted, however, by manually grasping and pulling apart barrel 12 and the cap 14. The barrel segment will easily move, with the protuberance 36 sliding along the operating zone 34 of the

track 30 until the protuberance abuts the lower end of the zone 34.

In FIG. 7, an alternate embodiment of the split ring retainer 22 is illustrated. In this embodiment, a split ring retainer 22*a* is shown. The retainer 22*a* includes a frustoconical split ring substantially identical to that of the embodiment previously described, however, a post 24*a* which extends from the retainer 22*a* to engage the ink cartridge is modified in configuration. The post 24*a* is formed of a curved transverse cross sectional configuration, the arc diameter of which is slightly greater than the diameter of the cartridge ink tube. When the ink tube is forced over the post 24*a*, the post walls are inwardly flexed thereby tightly engaging the ink tube.

A further embodiment of the pen previously described is illustrated in FIG. 8. In this embodiment, the pen barrel and cap are substantially identical to the barrel 12 and cap 14 previously described, however, a telescoping sleeve 28*b* is not formed of one piece construction with a modified cap 14*b*. The sleeve 28*b* is constructed of a hollow cylindrical element and is secured to the cap 14*b* in a conventional manner, e.g. force fitted, welded, etc.

Modifications of the track configuration are illustrated in the embodiments shown in FIGS. 9 through 12. In FIG. 9, a track 30*c* is formed in a sleeve 28*c* and includes, in a second or operating zone 34*c* and adjacent the upper end thereof, a sloped floor 38*c*. When a protuberance 36*c* (not shown) slides in the track 30*c* toward the distal end of the operating zone 34*c*, it engages and rides over the sloped floor 38*c*. The engagement between the floor 38*c* and the protuberance 36*c* provides an additional frictional restraint against inadvertent movement of the cap and barrel relative to each other when the pen is in its writing position.

In FIGS. 11 and 12 a still further embodiment of the invention is shown. A modified track 30*d* having a track configuration somewhat similar to that of the track 30*c* is shown. In lieu of the floor 38*c*, however, a sloped tongue 40*d* is provided at the upper end of an operating zone 34*d*. The tongue 40*d* initially engages the undersurface of a protuberance 36*d* (not shown) and in a manner similar to the floor 38*c* previously described, presents an additional frictional restraint against inadvertent movement between the cap and barrel when the pen is in its writing position.

Further modifications of track configurations are easily envisioned. For instance, the track operating zone may be curved to provide axial movement of the pen segments by twisting the segments relative to one another in lieu of pushing the segments together or pulling the segments apart. An example of a typical curved track configuration is shown in previous patent.

It will be appreciated that the invention heretofore described is ideally utilized in a number of applications. In one instance, both cartridges 18, 20 could be utilized with blue or black ink and thereby obviate the necessity of immediately replacing an ink cartridge when the ink supply of the one already in the pen becomes depleted. A further application is envisioned wherein a person desires to write in more than one color and the use of differently colored inks in the cartridges 18, 20 would obviate the need for separate pens. Since the pen structure described utilizes standard size ink cartridges which are readily available, a great advantage over multiple color pens used heretofore is provided.

It should also be appreciated that the novel pen of the present invention employing the split ring retainer and tracked telescoping sleeve can be readily adapted in a single refill embodiment to provide an easily operated retractable ball point pen utilizing standard refills and a much simplified retracting mechanism which is not dependent upon helical coil springs and the complicated structures heretofore used.

Without departing from the invention various modifications of the disclosed writing implement are easily envisioned. Not only may the novel aspects of the present invention be utilized with a single refill ball point cartridge, but various writing cartridges may be used in lieu of ball point cartridges. For instance, a thin pencil lead cartridge may be utilized alone, or instead of one or both ball point cartridges. Furthermore, a nylon tip liquid ink writing cartridge may be easily substituted for a ball point cartridge.

The pen cap, barrel and/or retainer may be fabricated of various metals or molded of conventional thermoplastics, e.g. high impact polystyrenes, acrilonitrile-butadiene-styrene, polyacetals, polyamides, etc.

It should also be apparent that the telescoping sleeve retaining and guiding system of the present invention could easily be inverted such that the sleeve would project from the pen barrel into a cap while still providing essentially the same structural operation and advantages.

Thus it will be seen that there is provided a ball point pen structure which achieves the various objects of the invention and which is well suited to meet the conditions of practical use.

As various changes might be made in the ball point pen structure as above set forth, it is understood that all matters herein described or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described the invention, there is claimed as new and desired to be secured by Letters Patent:

1. A writing implement comprising a body, the body including a first segment and a second segment, means forming an aperture at the end of the second segment, a writing cartridge, the cartridge having a writing tip, the cartridge being positioned within the body with the writing tip in registry with the aperture, means fixing the position of the cartridge relative to the first segment, the first segment being movable with respect to the second segment from a first position wherein the writing tip is contained within the second segment to a second position wherein the writing tip extends from the aperture, means for guiding the first segment with respect to the second segment between said positions and fixing the first segment with respect to the second segment at a selected position against separating forces transmitted through the cartridge during writing, said guiding and fixing means comprising a sleeve telescoping from one of the segments into the other segment, the sleeve being biased radially outward to a diameter greater than that of the other segment to thereby frictionally retain the segments at a selected position whereby a writing tip may be easily extended to or retracted from a writing position.

2. A writing implement constructed in accordance with claim 1 wherein the sleeve includes means forming

a slot to facilitate the frictional engagement between the segments.

3. A writing implement constructed in accordance with claim 1 wherein the first segment comprises a pen cap and the second segment comprises a pen barrel.

4. A writing implement constructed in accordance with claim 1 wherein the means fixing the position of the cartridge relative to the first segment comprises a retainer, frictional means securing the retainer at a selected position in the first segment, the retainer further including post means, the cartridge being secured over the post means.

5. A writing implement constructed in accordance with claim 4 wherein the post means includes a plurality of flukes extending into the cartridge.

6. A writing implement constructed in accordance with claim 4 wherein the retainer includes a split ring, the ring being biased radially outward to a diameter greater than that of the first segment at the selected position to thereby removably secure the retainer.

7. A writing implement constructed in accordance with claim 1 further including means forming an aperture at the end of the first segment, a second writing cartridge, the second cartridge having a writing tip, the second cartridge being positioned within the body with its tip in registry with the aperture in the first segment, means fixing the position of the second cartridge relative to the second segment, whereby two writing tips may be simultaneously extended to or retracted from writing positions.

8. A writing implement constructed in accordance with claim 7 wherein the means fixing the positions of the cartridges relative to the respective segments includes a pair of retainers, frictional means securing each retainer in one of the segments.

9. A writing implement constructed in accordance with claim 1 further including means forming a track in the sleeve, means forming a protuberance in the other segment, the protuberance extending into the track whereby relative movement of the two segments is guided.

10. A writing implement constructed in accordance with claim 9 wherein the track includes an operating zone, the protuberance being engaged in the operating zone when the first segment is in both its first position and its second position.

11. A writing implement constructed in accordance with claim 9 wherein the operating zone of the track includes means frictionally engaging the protuberance when the first segment is in its second position whereby an additional restraint against inadvertent movement of the segments is provided.

12. A writing implement constructed in accordance with claim 4 wherein the post means includes an arcuately curved wall, the wall being biased radially outward to a diameter greater than the inner diameter of the cartridge, the post extending into the cartridge with the wall being inwardly flexed, whereby the post tightly engages the cartridge.

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