April 1, 1969 R. A. LANOIE 3,436,160

RETRACTABLE WRITING INSTRUMENT

Filed Aug. 8, 1966

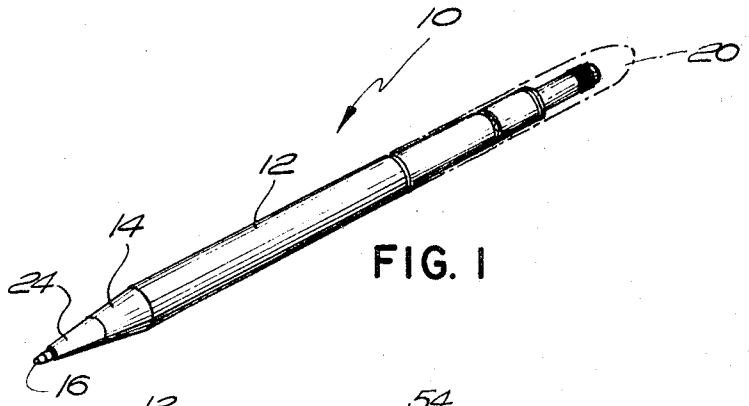


FIG. 1

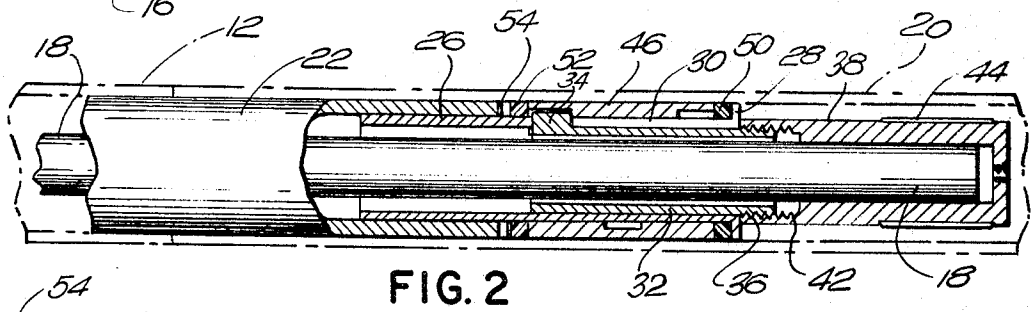


FIG. 2

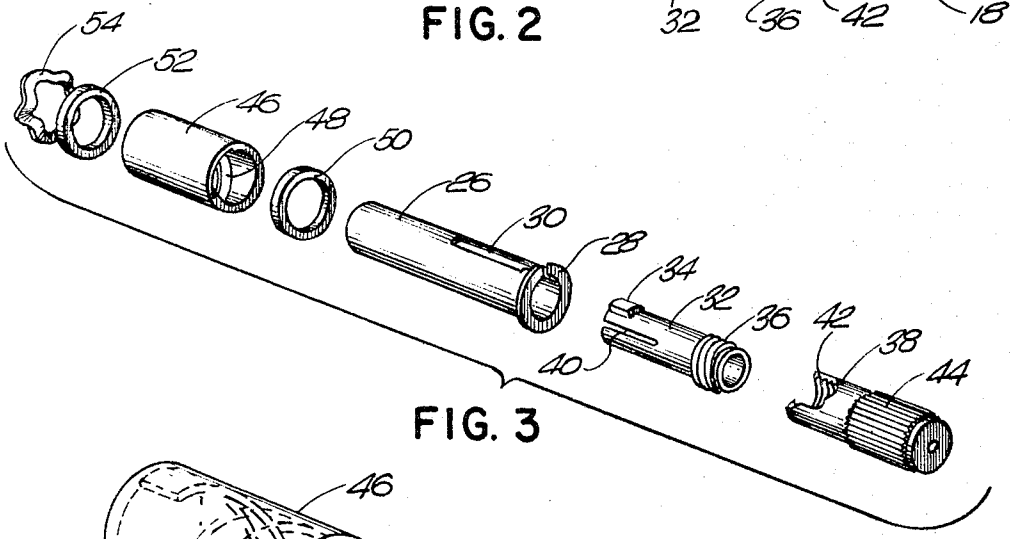


FIG. 3

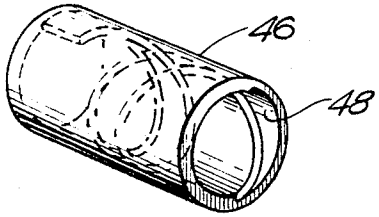


FIG. 4

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RETRACTABLE WRITING INSTRUMENT

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3 Claims

ABSTRACT OF THE DISCLOSURE

A retractable writing instrument having a cartridge that projects through a barrel of the instrument and is interconnected to a carrier adjacent to the rear end thereof, the carrier having a lug formed thereon that is received in a slot formed in a sleeve that is held in a relatively fixed position, and the lug being further received in a helical track that is formed interiorly of an operating member that is located in coaxial relation on the sleeve, the operating member being held against axial movement but being rotated for producing a corresponding axial movement of the carrier and the cartridge interconnected thereto.

The present invention relates to a retractable writing instrument. More particularly, the present invention relates to a writing instrument of the retractable type which includes a unique mechanism for producing the retracting or expelling of the writing end of a cartridge contained within the writing instrument.

The writing instrument embodied in the present invention is of that type which includes a cartridge, on the writing end of which a ball point is located. Ball-point pens have come into favor in recent years, and, as a result, a great variety of retracting operating mechanisms have been developed for use with this kind of writing instrument. Although the retracting operating mechanisms known heretofore have generally satisfied the need for which they have been employed, the more simple versions of these mechanisms have proven to be inadequately constructed and, after a period of use, have failed in operation. The more complicated mechanisms have been costly to manufacture and, therefore, have not been acceptable by the consumer. The present invention defines an operating mechanism for a ball-point writing instrument that is not only simple in construction but includes an arrangement of parts that is capable of long-term operation without failing and further defines an economical unit to manufacture. In carrying out the concept of the present invention, the ball-point cartridge is contained within a carrier that is in turn secured to an adapter. Enveloping the carrier is a sleeve having a slot formed therein and into which a lug joined to the carrier is received. The sleeve is fixed against rotation, thereby preventing rotation of the lug therewith and inducing longitudinal movement of the lug within the slot. In order to move the lug in a longitudinal direction within the slot that is formed in the sleeve, a tubular operating member having an interior track formed therein is provided and is mounted in coaxial relation on the sleeve so that the track receives the lug therein. The tubular operating member receives the cap of the instrument therearound and is rotatable therewith, the rotation of the tubular operating member causing a corresponding linear movement of the carrier and adapter through movement of the carrier lug within the slot formed in the sleeve. Since the carrier and adapter are moved in a longitudinal direction upon rotary movement of the tubular operating member, the cartridge secured to the adapter is caused to move in a corresponding longitudinal direction.

Accordingly, it is an object of the present invention to provide a writing instrument having a relatively simple retracting mechanism composed of a minimum number of parts that produces longitudinal movement of the writing cartridge upon rotating movement of the cap of the writing instrument.

Another object of the invention is to provide an assembly for a retractable writing instrument that includes a fixed sleeve having a slot formed therein into which a lug of a cartridge carrier is received, the lug further being received in a track of a tubular operating member that is rotatable to produce a corresponding longitudinal movement of the carrier and writing cartridge interconnected thereto.

Still another object is to provide a retractable writing instrument that is operated by the simple rotation of the cap of the instrument and that includes a compact organization of operating parts.

Other objects, features and advantages of the invention will become apparent as the description thereof proceeds when considered in connection with the accompanying illustrative drawing.

In the drawing which illustrates the best mode presently contemplated for carrying out the present invention:

FIG. 1 is a perspective view of the retractable writing instrument embodied in the present invention with the cap shown in phantom;

FIG. 2 is a sectional view with a portion shown in elevation of the operating parts of the retractable writing instrument embodied herein and with portions of the cap and barrel shown in phantom;

FIG. 3 is an exploded perspective view of the operating parts of the retractable writing instrument; and

FIG. 4 is a perspective view with portions shown in dotted lines therein of the operating member of the retractable writing instrument.

Referring now to the drawing and particularly to FIG. 1, the retractable writing instrument embodied in the present invention is generally indicated at **10** and includes a barrel **12** that comprises a forward conical portion **14** and a removable tapered point **24** through which a writing tip **16** of a cartridge **18** is adapted to extend. A removable cap **20** is mounted on the rear portion of the writing instrument, as will be described, and is adapted to be rotated with respect to the barrel **12** for producing the retracting or expelling operation of the writing tip **16**. The cap **20** will further include a conventional clip, not shown, that is provided for securing the writing instrument in the pocket of the user.

Referring now to FIGS. 2, 3 and 4, the operating mechanism of the writing instrument is illustrated and includes an inner elongated tubular member **22** that extends within the barrel **12** toward the tapered end **14** and is secured in place by the tapered point **24** that is threadably interconnected thereto. Fixed in the rearmost end of the inner tubular member **22** in press fitting relation is a tubular sleeve **26** which as shown in FIG. 2, terminates at the rearmost end thereof in a flange **28** and is further provided with a longitudinally extending slot **30**. Since the tubular sleeve **26** is disposed in press fitting relation with respect to the inner surface of the tubular member **22** it is thus restrained from rotary movement.

Located within the tubular sleeve **26** in telescoping relation with respect thereto is a cartridge carrier **32**, on the forward end of which a lug **34** is mounted. The rearmost end of the cartridge carrier **32** is formed with threads **36**, the purpose of which is to receive a tubular adapter indicated at **38**. If the carrier **32** is fabricated of a metal material then the body thereof will be formed with a slot **40** as shown in FIG. 3, the slot **40** providing for movement of the carrier within the tubular sleeve **26**.

It is also contemplated to mold the carrier **32** of a plastic material in which event the inherent resilience of the plastic material would enable the carrier to be inserted into the tubular sleeve **26** and the slot **40** would then be eliminated. When the carrier **32** is located in proper position within the tubular sleeve **26**, the lug **34** projects through the slot **30**, and is movable therein, which as will be described provides for longitudinal movement of the carrier **32** within the tubular sleeve **26**. It is apparent that this longitudinal movement of the carrier **32** within the tubular sleeve **26** will be limited by the length of the slot **30**.

Threadably joined to the rear end of the carrier **32** is the tubular adapter **38** the forward end of which has internal threads **42** formed therein for receiving the external threads **36** of the carrier **32**. A knurled portion **44** is formed on the rearmost end of the adapter **38** and provides a gripping surface for securing the cap **20** to the adapter **38**. As illustrated in FIG. 2, the writing cartridge **18** extends centrally of the operating mechanism and projects through the inner tubular member **22**, carrier **32**, and into the adapter **38** for frictional engagement therewith. As will be described, the writing cartridge **18** will move in a longitudinal direction with the adapter **38** and carrier **32** as the carrier and adapter are moved within the sleeve **26** in a longitudinal direction therein.

In order to provide for the retracting or expelling operation of the writing tip **16** of the cartridge **18**, an operating member **46** is provided and, as illustrated in FIGS. 3 and 4 in particular, is formed in a tubular construction, the interior surface of which is formed with an internal track **48** that is spiral in configuration. Referring again to FIG. 2, the tubular operating member **46** is shown mounted on the tubular sleeve **26** in telescoping relation, the spirally formed track **48** receiving the lug **34** of the carrier **32** therein.

As further illustrated in FIG. 2, the operating member **46** is fixed against longitudinal movement, the end thereof engaging flexible rings **50** and **52** that are disposed in encircling relation around the sleeve **26** and provide for smooth rotation of the operating member. A washer **54** also located around the sleeve **26** acts to apply tension to the operating member **46** for producing a position operation thereof.

In order to impart rotary movement of the operating member **46**, the cap **20** is disposed in telescoping relation therearound and in frictional engagement therewith. Thus, when the cap **20** is rotated with respect to the barrel **12**, the operating member **46** will be rotated therewith. If required, an adapter sleeve may be telescoped on the operating member **46** in friction fitting relation and will be received within the cap **20**. As previously noted, the sleeve **26** is fixed against rotation by means of the frictional fit thereof with the inner surface of the tubular member **22**. In operation, when the operating member **46** is rotated with the cap **20**, the carrier **32** will be caused to move in a longitudinal direction because of the location of the lug **34** in the slot **30** of the tubular sleeve **26**. Since the adapter **38** is interconnected to the carrier **32**, it, together with the cartridge **18**, will move with the carrier **32** in a longitudinal direction as the operating member **46** is rotated. It is apparent that longitudinal movement of the carrier **32** is limited by the confines of the slot **30**, the extreme ends of the slot **30** defining the expelled or forward position of the writing tip **16** and the retracted or rearward position thereof.

As described hereinabove, the writing instrument **10** is relatively simple in construction, and the component parts may be assembled in a minimum number of manufacturing operations. In this connection many of the assembly steps are capable of being performed automatically which further reduces the assembly time and cost of manufacture. Insofar as the component parts of the assembly are concerned, the operating member **46** as well as the sleeve **26** and carrier **32** may be molded of a plastic material if it is so desired. Other parts may be machined of metal or molded, as required. As further described above, the operation of the writing instrument is carried out by a simple rotating movement of the cap **20**, and the component parts are positively retained in the position to which they are moved after each operating movement.

While there is shown and described herein certain specific structure embodying the invention, it will be manifest to those skilled in the art that various modifications and rearrangements of the parts may be made without departing from the spirit and scope of the underlying inventive concept and that the same is not limited to the particular forms herein shown and described except insofar as indicated by the scope of the appended claims.

What is claimed is:

1. In a writing instrument, a barrel, a writing cartridge located within said barrel and having a writing tip that is expelled from or retracted into said barrel, a carrier located in coaxial relation around said cartridge adjacent to the rearmost end thereof and being interconnected thereto, a lug joined to said carrier, a tubular member located in fixed position in said barrel, a tubular sleeve fixed in said tubular member against rotation and having a longitudinally extending slot formed therein, an operating member mounted for rotation on said tubular sleeve between the ends of said sleeve and having an interior helical track formed therein, means mounted on said tubular sleeve and engaging said operating member for fixing said operating member against longitudinal movement, said carrier being received in said tubular sleeve for axially sliding movement therein, the lug joined to the carrier extending through the slot in said tubular sleeve and being operatively received in the interior helical track of said operating member, and means frictionally engaging said operating member for producing rotation thereof, wherein the carrier and writing cartridge interconnected thereto are moved a corresponding longitudinal distance.

2. In a writing instrument as set forth in claim **1**, an adapter secured to said carrier and receiving the rearmost end of said cartridge therein for movement therewith, wherein longitudinal movement of said carrier produces a corresponding movement of said adapter and cartridge received therein.

3. In a writing instrument as set forth in claim **2**, an operating cap located in coaxial relation around said tubular member and interengaged therewith, said cap enveloping the adapter, and being rotatable with respect to said barrel to rotate said operating member, wherein said carrier, adapter and cartridge are moved in a longitudinal direction.

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