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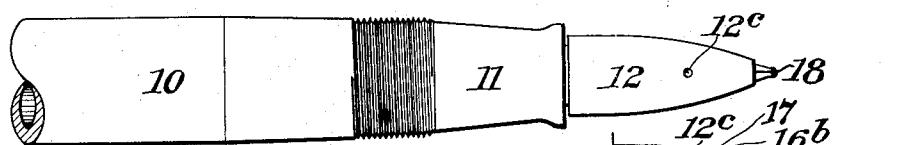
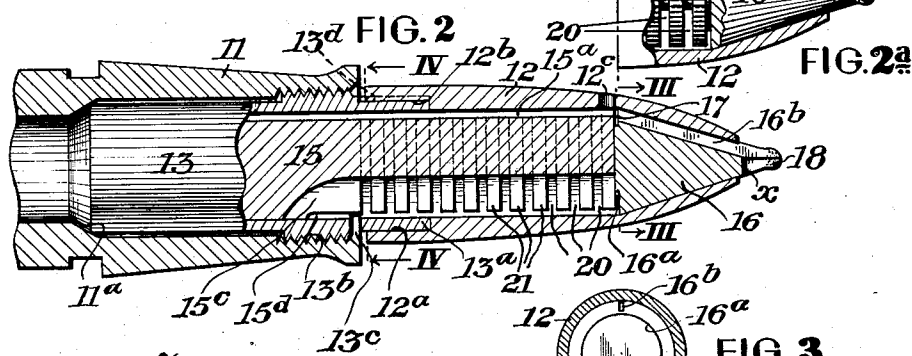
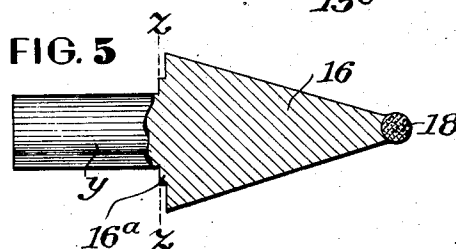
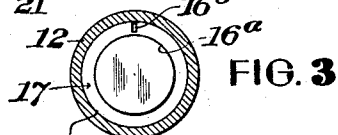
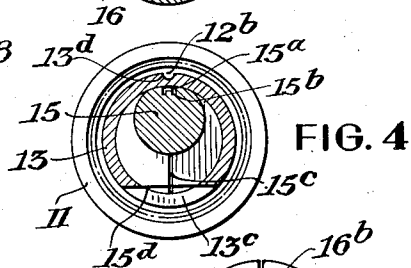
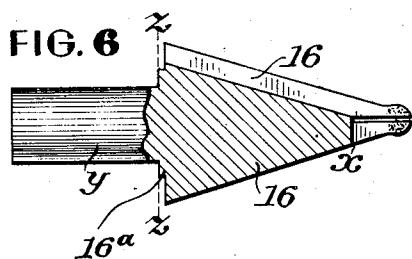
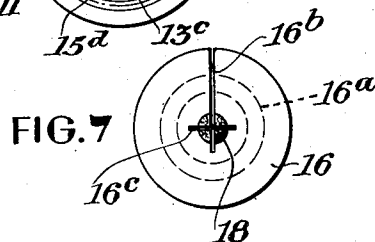
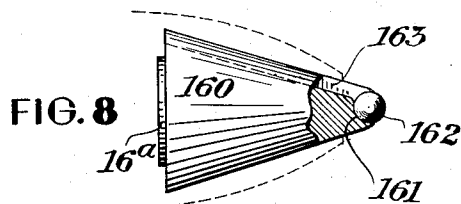
S. E. TOWNSEND

2,513,380

WRITING INSTRUMENT

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FIG. 1



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UNITED STATES PATENT OFFICE

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WRITING INSTRUMENT

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10 Claims. (Cl. 120—51)

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My invention relates to writing instruments of the fountain pen type; more particularly stylographic pens, with which ordinary fluid ink is employed.

A well-known fountain pen, now in wide use, employs a so-called "unit insert," comprising a nib and feed-bar assembly enclosed in and carried by a sleeve or shell which may be in threaded engagement with the pen section or the fountain pen barrel; the inner end of such sleeve firmly engaging a seat disposed within such pen section or the barrel and preventing leakage.

The improvement forming the subject of my invention comprises an assembly including a feed-bar and an improved form of writing point or nib structure arranged in proper relative position with respect to the feed-bar; the latter being mounted in a sleeve or shell which may be carried by the pen section or at the end of the barrel; the forward end of the feed-bar and the nib being enclosed by a separate shell or cover—preferably of streamlined tapering contour—which shell or cover is apertured at its forward end and gives the complete assembly, including the insert element, a pleasing shape or appearance to the writing instrument.

A further object of my invention is to simplify the construction and arrangement of the parts and to provide an insert structure interchangeable with any fountain pen of the type employing the "unit insert" before referred to.

A further object of my invention is to provide a conical member serving as the writing point structure; such conical member being separate from the feed-bar and arranged in abutting relationship therewith and with a capillary space between these parts. The forward end of the writing point structure projects through the open end of the enclosing shell.

A further object of my invention is to provide the conical writing point member with a hardened tip serving as the paper-contacting portion; such hardened tip being welded in place.

A further object of my invention is to provide the conical writing point member with a capillary groove along its outer wall surface, which groove communicates with the capillary space adjacent the feed-bar and extends through the hardened tip for the passage of ink thereto; to cross slit such hardened tip substantially at right angles to the capillary groove, and to subsequently bring the several projections produced by the slitting operations into substantial engagement at the extreme end of the same to produce the desired writing point.

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And a still further object of my invention is to provide the conical writing point member with a ball-point suitably seated at the end of the same and receiving ink from the capillary groove; such ball being retained in place by spinning or peening the metal at the end of the conical member to an extent that will hold the ball in place and at the same time provide sufficient clearance to insure that the ball will revolve during a writing operation.

These and other features of my invention are more fully set forth hereinafter; reference being had to the accompanying drawings, more or less diagrammatic in character, in which:

Figure 1 is a longitudinal elevation, partly broken away, of a writing instrument within the scope of my invention.

Fig. 2 is a fragmentary view, partly in section, of the forward end of my improved writing instrument; showing the feed-bar and nib assembly.

Fig. 2^a is a fragmentary view of the forward portion of the feed-bar and nib assembly, illustrating a modified detail of my invention.

Fig. 3 is a cross sectional view on the line III—III, Fig. 2.

Fig. 4 is a cross sectional view on the line IV—IV, Fig. 2.

Fig. 5 is an elevational view, partly in section, of the conical writing point member before completion and assembly; showing a hardened tip welded to the point of the same.

Fig. 6 is a similar view of the same part after the slitting operations.

Fig. 7 is an end view of Fig. 6.

Fig. 8 is a view of the conical nib structure provided with a ball-point.

My present improvements have been applied to an ordinary fountain pen structure employing any usual or proper type of fluid ink as distinguished from the pasty material employed with ball-pointed pens, and my improved structure is more in the nature of a stylographic instrument in that there is practically no flexure of the writing point. A cap of usual construction may be employed and such cap will be provided with a so-called inner cap which, when in place on the barrel, engages the outer end of the pen section to seal the same.

In Figure 1 of the drawings, which shows an elevational view of my improved writing instrument, the pen barrel is indicated at 10 and, in this instance, has a pen section 11, from which extends a stream-lined and/or tapered shell or closure 12 containing the improved nib or writing point member and enclosing the feed-bar, as more

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particularly pointed out hereinafter. In those fountain pens having lever-operated filling mechanism, the inner end of the pen section will carry an ink sac of usual type (not shown). If a sac is not employed, filling means of any suitable character may be associated with the structure to introduce supplies of ink into the barrel.

The outer end of the pen section, or the pen barrel, receives a tubular sleeve 13 forming part of a renew-point insert of substantially the same character as the "unit insert" disclosed in the patent of H. C. Klagges, No. 2,292,381, August 11, 1942. In the present instance, this sleeve 13 is shown as engaging a seat 11^a within the pen section 11 to insure against leakage, and it has a tubular portion 13^a, forward of the threaded portion 13^b for connection with the tapered shell or cover 12, for a purpose to be described.

Carried by the sleeve 13 is a special form of feed-bar, indicated at 15, more or less like the feed-bar described in the patent of H. C. Klagges, above referred to, and this feed-bar is permanently secured to the sleeve 13 by any suitable means. In the present instance, the tapered end of such feed-bar, which would normally underlie the pen nibs when employed with a fountain pen of the ordinary type, has been removed.

In addition to the capillary grooves 15^a and 15^b on one side of this feed-bar for the passage of ink and air, illustrated in the present instance as the upper side; such grooves communicating with the supply of ink, this feed-bar is provided with a relatively deep longitudinal groove of capillary dimensions on the side opposite the grooves 15^a and 15^b, and such latter groove is indicated at 15^c. The groove 15^c extends into the portion 13^a of the sleeve 13, and the latter has an air inlet communicating with this groove. This air inlet may be provided by cross slotting or notching the portion 13^a of the sleeve 13 at a point just forward of the threads 13^b, as indicated at 13^c. The forward end of the feed-bar may be cut off squarely for a purpose to be described.

At the forward end of the feed-bar, I mount a conical member 16, the outer and pointed end of which, when provided with a hardened tip, serves as the writing point or paper-contacting end of the instrument. The rear end of this conical member is cut off squarely at right angles to its longitudinal axis and lies in engagement with the forward end of the feed-bar. At the point of engagement with the feed-bar I provide the conical member with a shoulder 16^a of such dimensions as to provide, outwardly of the same, an annular capillary space 17 between the end of the feed-bar and the inner end of such conical member. The conical member is provided with a capillary groove 16^b along one side of the same which communicates with this annular capillary space.

While it will be understood that the preferred arrangement of parts to provide the annular capillary space 17 is as just referred to and as illustrated in Fig. 2, in lieu thereof the forward end of the feed-bar may be provided with a slight projection similar to that shown at the rear end of the conical member and of such diameter as to provide an annular capillary space that will function in the same manner as that provided by the shoulder at the rear end of the conical member; such modified arrangement being illustrated in Fig. 2^a.

At the forward and outer end of the conical member, which may be composed of some form of suitable ferrous metal—stainless steel, for in-

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stance—unaffected by ink, I weld a hardened pellet 18, which is to form the writing point or paper-contacting end of the instrument. This pellet may be of some form of iridium alloy or the like, and after it has been welded to the smaller end of the conical member, the latter may be provided with the groove 16^b by a suitable milling or slotting operation which extends to and includes the hardened pellet 18 welded to the end of the same and vertically along the line *z*. In addition to the operation producing the capillary groove 16^b, the hardened pellet and the tapered end of the conical member are cross-slotted to the line *z*, as indicated at 16^c.

The forward end of the feed-bar and the conical member associated therewith are enclosed by the tapered cover or shell 12 which closely fits these parts and presents externally a tapered, substantially stream-lined contour. The inner end of this shell or cover may be recessed as indicated at 12^a to fit tightly over the forward extension 13^a of the sleeve 13, and in order that these parts may be properly positioned, the wall of the recessed portion of the shell or cover 12 may be provided with a rib 12^b adapted to enter a groove 13^d formed in the extension 13^a of the sleeve 13. If desired, the parts forming this connection may be reversed. The engagement of the cover or shell 12 with the sleeve 13 may be wholly frictional, or means may be provided to hold them in positive engagement. If necessary or desirable, the forward end of the cover or shell 12 may be provided with an air intake, indicated at 12^c, adjacent to the annular capillary space 17 between the inner end of the conical member and the forward end of the feed-bar.

The feed-bar is provided with capillary spaces for the reception and storage of excess ink, indicated at 20, which spaces are separated by the combs or partitions 21. To insure communication between these capillary spaces 21, the under face of the feed-bar is slightly flattened, as indicated at 15^d directly adjacent the longitudinal slot 15^c, and this flattened portion extends into the forward end of the sleeve 13.

The conical member may be produced from bar stock and in the steps of its production it carries the cylindrical projection or arbor *y*, illustrated in Figs. 5 and 6. After the pellet of hardened material has been welded to the end of the same, and the slotting operations have been completed, this projection is cut off along the line *z-z*.

I may employ a ball-point with my improved writing instrument, and for this purpose the end of the conical member may be developed in the manner indicated in Fig. 8. In this instance, the conical member, indicated at 160, may be provided with a seat 161 for a ball, indicated at 162. This seat may be rounded in any suitable manner to form a socket to receive the ball and a rim for retaining the ball to such seat may be formed by spinning or peening the metal at the end of the conical member after the capillary slot, indicated at 163, has been formed. Such slot may have its lower portion curved so as to lead toward the ball seat. The extent of the inturned rim is just sufficient to retain the ball in place with sufficient clearance to insure free rotation of the ball during a writing operation.

While, for convenience, the capillary slot 16^b (and/or 163) is shown in the drawings as located at the upper side of the conical member 16 (or 160) it will be understood that it is not necessary, in the use of my improved writing instrument,

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that such capillary slot be in the uppermost position. I have found, in the use of this writing instrument, that it will function properly when held in any usual writing position no matter how such capillary slot may be related to the particular position in which the instrument is held.

While I have illustrated and have described with some particularity the manner in which my invention may be carried into effect, this disclosure is for illustrative purposes only and not as a limitation inasmuch as modifications may be made which embody the spirit of my invention; all of which is deemed to be within the scope of the appended claims.

I claim:

1. A writing instrument comprising a barrel including a reservoir for ink and internally provided with a seat, a sleeve mounted at the end of the barrel and engaging the seat inwardly thereof to prevent leakage, said sleeve having a forward extension, a feed element having capillary spaces for the reception and storage of ink carried by said sleeve, a cover or shell carried by the forward extension of the sleeve enclosing said feed element and having an open forward end, and a conical writing point member mounted in the forward end of said cover and projecting through its opening; said conical member being disposed in abutting relationship with respect to the feed element; there being an annular capillary space between said parts for the passage of air and ink to and from the ink reservoir.

2. A writing instrument as set forth in claim 1 having the feed element and the conical writing point member in abutting relationship with one of said parts having its meeting face shaped to provide an annular capillary space when they are in engaging relationship.

3. A writing instrument as set forth in claim 1 with an annular capillary space between the conical writing member and the feed element and with the conical member provided with a capillary groove extending to its writing point and in communication with the annular capillary space between the same and the feed element.

4. In a writing instrument of the character described comprising a barrel including a reservoir for ink, a pen section at the forward end of the barrel, a sleeve carried by said pen section in threaded engagement therewith; said sleeve having a forward extension, a feed element carried by said sleeve, a cover having an apertured forward end enclosing said feed element carried by said sleeve extension, and a conical member mounted in the forward end of said cover and having a portion providing a writing point extending through the opening thereof; said conical member having a central projecting portion abutting the forward end of the feed element and providing with the latter an annular capillary space for the passage of air and ink to and from the ink reservoir.

5. In a writing instrument of the character described comprising a barrel including a reservoir for ink, a pen section at the forward end of the barrel, a sleeve carried by the pen section in threaded engagement therewith; said sleeve hav-

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ing a forward extension, a feed element carried by said sleeve, a cover having an apertured forward end enclosing said feed element carried by said sleeve extension, and a conical member mounted in the forward end of said cover and having a portion providing a writing point extending through the opening thereof; said conical member abutting the forward end of the feed element and having a shouldered portion whereby an annular capillary space is provided between the parts and said conical member having a capillary groove communicating with said annular capillary space and extending to the writing point end.

6. In a writing instrument, the combination with the pen section of a fountain pen, of a sleeve in threaded engagement therewith; said sleeve having a forward extension, a feed element carried by the sleeve having a comb providing capillary spaces for the reception and storage of ink, a conical member forward of the feed element; said parts being arranged to provide an annular capillary space at their zone of engagement and said conical member having a slotted end providing a writing point and a capillary groove communicating therewith, and a cover enclosing said conical member and the feed element and carried by the forward end of the sleeve supported in the pen section; said cover being apertured at its forward extension for the passage of the writing point.

7. A writing instrument as set forth in claim 6 wherein the writing point has a hardened tip cross-slotted to facilitate the passage of ink and wherein the conical member is provided on its outer face with a capillary groove communicating directly with one of said slots and the annular capillary space between the feed element and the conical member.

8. A writing instrument as set forth in claim 6 wherein the comb of the feed element is provided with a flattened surface underlying its capillary spaces and the sleeve carrying the feed element is provided with an air inlet communicating with the space provided by such flattened portion.

9. A writing instrument as set forth in claim 6 wherein the feed element has a longitudinal slot of material depth opposite its capillary grooves for the passage of air and ink.

10. A writing instrument as set forth in claim 6 wherein the cover enclosing the feed element and the conical member is spaced from the pen section and the sleeve carrying the feed element is slotted for the passage of air opposite the space between the cover and the pen section.

SAMUEL E. TOWNSEND.

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