Feb. 9, 1971 E. BOK 3,561,881

STYLOGRAPHIC PEN WITH THE CAPILLARY PASSAGE CLEANING MEANS OPERABLE BY HAND OR BY SHAKING OR CONTACT

Filed May 7, 1969 3 Sheets-Sheet 1

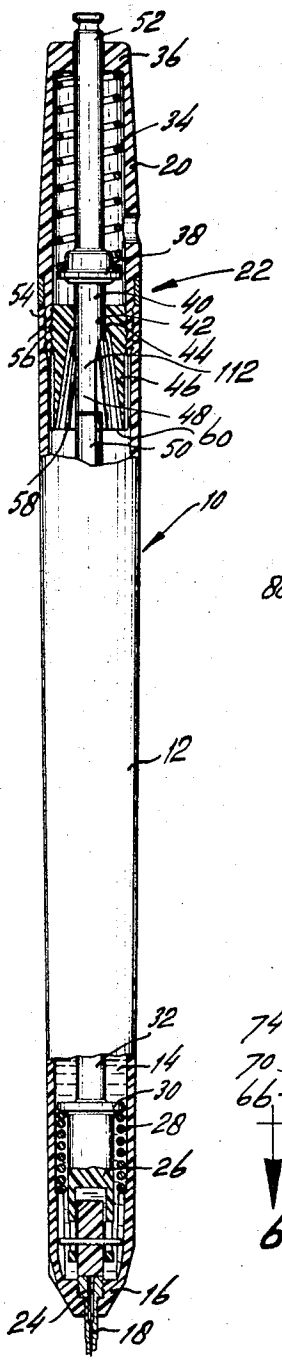


FIG. 1

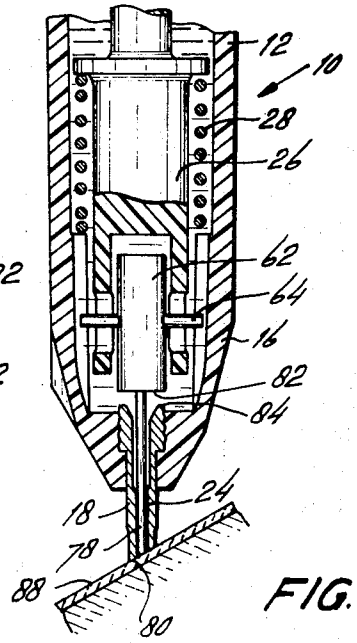


FIG. 5

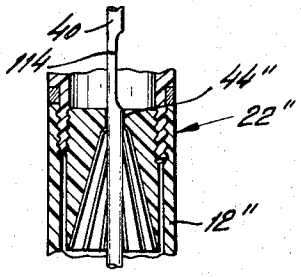


FIG. 12

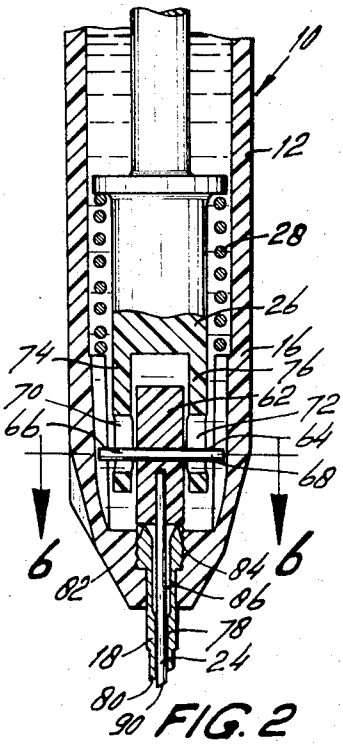


FIG. 2

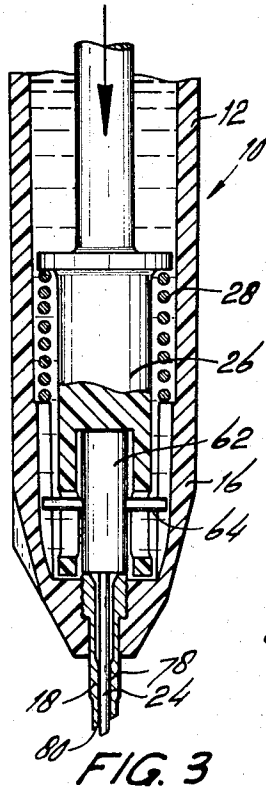


FIG. 3

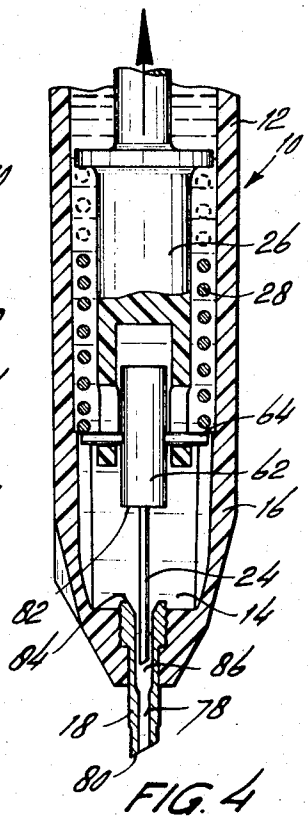


FIG. 4

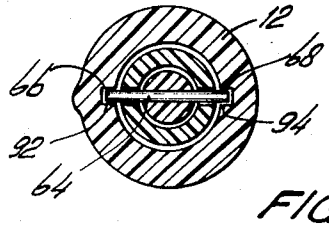


FIG. 6

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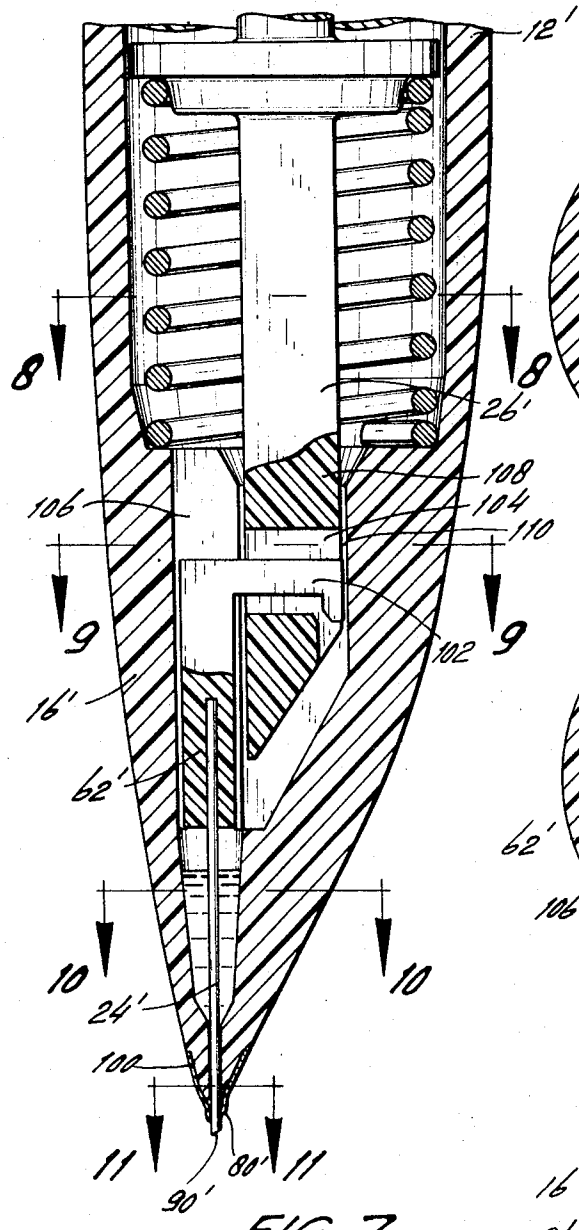


FIG. 7

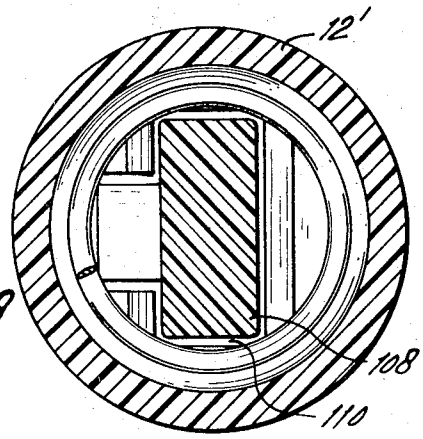


FIG. 8

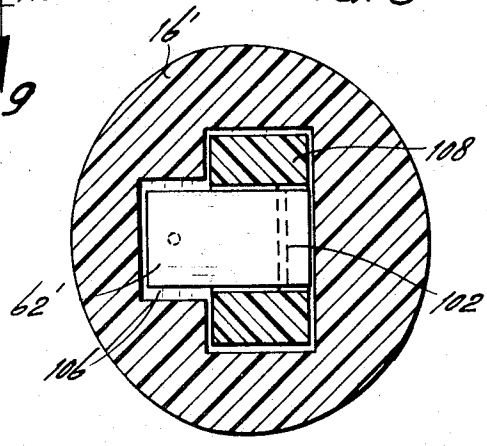


FIG. 9

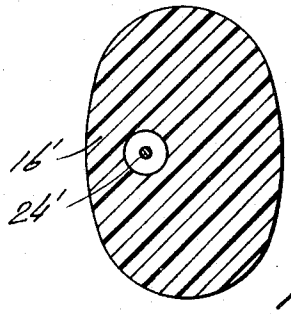


FIG. 10



FIG. 11

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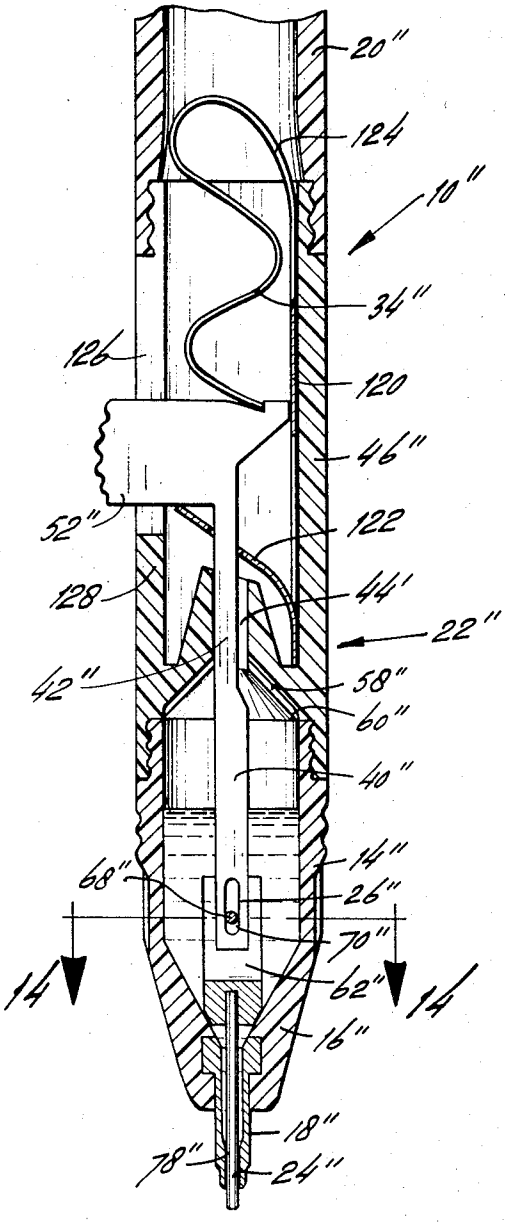


FIG. 13

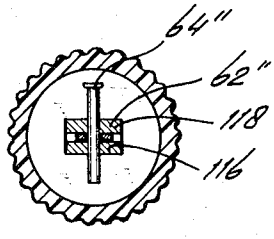


FIG. 14

INVENTOR
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United States Patent Office 3,561,881 Patented Feb. 9, 1971

3,561,881

STYLOGRAPHIC PEN WITH THE CAPILLARY PASSAGE CLEANING MEANS OPERABLE BY HAND OR BY SHAKING OR CONTACT

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New Bedford, Mass. 02747

Filed May 7, 1969, Ser. No. 828,415
Int. Cl. B43k 1/10
U.S. Cl. 401—258 14 Claims

ABSTRACT OF THE DISCLOSURE

A stylographic writing pen having a longitudinally displaceable wire in the capillary passage of its pen stylus whereby in rest position this wire protrudes through the pen tip bottom and either by hand or by longitudinally shaking of the pen or by resting of the pen tip on the writing surface, the wire can be more or less retracted into the ink passageway.

FIELD OF THE INVENTION

This invention is such as to encompass all pens be they for drafting or scribing and is particularly adapted to pens in which the reservoir of ink comprises an integral portion of the barrel defining the pen.

SUMMARY OF THE INVENTION

According to the present invention, the writing pen comprises a housing which also serves as an ink reservoir. This housing has a pen tip, communicating with the housing via capillary passage. An integrated reservoir vent stem is located in the housing which is connected to a cleaning wire, said wire extending into the capillary passage, the top of the vent stem being connected to a manually operable knob protruding through the top of the pen. An upper and a lower compression spring acting upon the combination of vent stem and cleaning wire housing provides a balanced rest position for this combination with the cleaning wire balanced within the capillary passage or even protrudes through the pen tip bottom. In longitudinal downward knob position the cleaning wire definitely is forced to pen tip bottom protruding position. In longitudinal upward position of the knob the cleaning wire is retracted from the cleanng channel into the ink reservoir chamber.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view in side elevation of the stylographic writing pen according to the invention;

FIG. 2 is an enlarged fragmentary vertical sectional view of the writing nib of the pen according to FIG. 1, with the cleaning wire housing in its balanced rest position, protruding through the pen tip bottom;

FIG. 3 is an enlarged fragmentary vertical sectional view of the writing nib of the pen according to FIG. 1, with the cleaning wire housing forced to its downward position and the cleaning wire protruding through the pen tip bottom;

FIG. 4 is an enlarged fragmentary vertical sectional view of the writing nib of the pen according to FIG. 1, with the cleaning wire housing urged to its upward position and the cleaning wire retracted into the ink chamber;

FIG. 5 is an enlarged fragmentary vertical sectional view of the writing nib of the pen according to FIG. 1, with the cleaning wire housing in its balanced rest position and the cleaning wire urged upwards through the contact of pen tip bottom and writing surface;

FIG. 6 is a transverse sectional view of the writing pen taken along section lines **6**—**6** of FIG. 2;

FIG. 7 is an enlarged fragmentary vertical sectional view of a modified writing nib of the pen according to the invention with the cleaning wire housng in balanced rest position;

FIG. 8 is an enlarged transverse sectional view of the writing nib taken along lines **8**—**8** of FIG. 7;

FIG. 9 is an enlarged transverse sectional view of the writing nib taken along lines **9**—**9** of FIG. 7;

FIG. 10 is an enlarged transverse sectional view of the writing nib taken along lines **10**—**10** of FIG. 7;

FIG. 11 is an enlarged transverse sectional view of the writing nib taken along lines **11**—**11** of FIG. 7;

FIG. 12 is an enlarged fragmentary vertical sectional view of another vent system being used in the writing pen according to the invention;

FIG. 13 is an enlarged vertical cross section of still another vent system being used in the writing pen according to the invention;

FIG. 14 is an enlarged transverse sectional view of the writing nib taken along lines **14**—**14** of FIG. 13.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

As is shown in FIG. 1, pen **10** consists of barrel **12**, which also serves as the ink reservoir for the ink **14**, writing nib **16** and the pen tip **18**. The barrel **12** is provided with the cap **20**, in which the vent system **22** is located. Cleaning wire **24**, which extends through pen tip **18**, is longitudinally movably connected to the cleaning wire housing **26**. Compression spring **28** is located in the lower part of the barrel **12** between the writing nib **16** and the spring base **30** of the housing extension **32**. This compression spring **34** is located in the top of barrel cap **20** between cap top **36** and the spring base **38** of the vent stem **40** and provides in opposition to the lower compression spring **28**, the longitudinally balanced rest position of the cleaning wire housing **26** and the vent stem **40**, which stem protrudes with its valve part **42** through the vent opening **44** of the vent housing **46** to inside the ink reservoir (barrel) **12** and urges its lower end **48** against the top **50** of the housing extension **32**. Such balanced rest position pertains, so long as no longitudinally compressive forces are applied on the vent stem **40** via projection knob **52**, which protrudes through an opening in the top **36** of cap **20**. The barrel cap **20** is, by means of the screw thread **54**, leak-free attached to the barrel **12** and is removable to provide the filling with ink of the barrel **12**. The vent housing **46** is by means of screw thread **56** leak-free attached to the cap **20** and can be removed for cleaning the interior of the cap **20**. The vent housing **46** is provided with ink passages **58** which radially run from the vent opening **44** to the lower housing end **60**, and which ink passages **58** provide an ink free vent system **22** to enable proper venting of the barrel **12**.

In FIGS. 2, 3, 4 and 5 enlarged fragments of the writing nib **16** indicate the longitudinal positions of the cleaning wire **24** and the wire housing **26**. The cleaning wire **24** is connected to the weight **62**. This weight has a pin **64** which pin transversely protrudes on both sides through the weight **62** and in which ends **66** and **68** are movable in the longitudinally extending slots **70** and **72** of the sides **74** and **76** of the housing **26**. The cleaning wire is movable through the ink passageway **78** of the pen tip **18** and in the position of FIG. 2, protrudes through the inclined pen tip bottom **80**; bottom **82** of weight **62** resting upon pen tip top **84**.

As indicated in FIG. 3, the wire housing **26** is urged downwardly to its downward position against the pressure of spring **28**, forcing the cleaning wire **24** to protrude through the pen tip bottom **80**, as is required during the

starting operation of the pen by hand or for required cleaning of the ink passageway **78**.

As is shown in FIG. 4, the wire housing **26** is being urged to its top position, which is achieved if, after the downward thrust of the knob **52** (FIG. 1) by hand, against the force of the strong compression spring **28** to its lowest position, the knob suddenly is released. The wire housing **26** and vent stem **40** then react, under the force of spring **28**, upwardly against the relatively weak pressure of low tension spring **34**, whereby the build up of speed by the upward movement, together with the weight (mass) of the housing **26** and stem **40** provides such momentum, that the upward moving of the housing **26** proceeds beyond the rest position to the top position (upper limit) after the upward thrust of spring **28** on the housing **26** is ended. The cleaning wire **24** is thereby retracted in the ink chamber **86**, providing escape of ink **14** from the chamber **86** into the passageway **78** for cleaning purposes of the passageway.

As shown in FIG. 5, with the housing **26** in its rest position, the cleaning wire **24** is forced upward with the weight bottom **82** removed from the pen tip top **84**, if during writing the pin tip bottom **80** moves over the writing surface **88**. As soon as contact between pen tip bottom **80** and writing surface **88** ends, then the cleaning wire automatically moves back to its downward position as indicated in FIG. 2.

In FIG. 6, as shown, for the purpose of having both inclined pen tip bottom **80** and inclined wire bottom **90** aligned, the pin ends **66** and **68** also are guided in the grooves **92** and **94** of the barrel **12**.

In FIG. 7, a modified writing nib **16'** is presented, whereby the nib **16'** is provided with and according to the center of the barrel **12'** offset nib reinforcement **100**. The cleaning wire **24'** is attached to the weight **62'**, which said weight is provided with the transverse arm **102**, the arm being locked in slot **104** of the housing **26'**.

The weight **62'** is longitudinally movable in guide groove **106** of barrel **12'** to provide alignments of both inclined pen tip bottom **80'** and wire bottom **90'** as is also shown in FIG. 9.

In FIG. 8, the rectangular profile of housing part **108** is shown which said part is longitudinally movable in the bottom recess **110** of the barrel **12'**.

FIGS. 10 and 11 show the respective transverse profiles of writing nib **16'** and reinforcement **100**. Venting of the barrel **12** (FIG. 1) takes place in the upward position of the vent stem **40**, whereby the recessed lower stem part **112** only partly seal off the vent opening **44**.

In FIG. 12, another vent system **22''** in rest position is shown, whereby the venting of the barrel **12''** as ink reservoir takes place in the downward position of the vent stem **40''**, the recessed upper stem part **114** only partly sealing off the vent opening **44''**.

In FIGS. 13 and 14 a modified pen **10''** is shown, whereby another type of venting is being used. However, here also the same functions for the vent stem **40''** to provide longitudinal displacement of the cleaning wire **24''**, which is connected with the wire weight **62''**.

The upper part of the wire weight **62''** is provided with two side portions **116** and **118**. The lower part of the flat sided vent stem **40''** is positioned in between these two portions **116** and **118** and is provided with slot **70''**. The pen **64''** transversely protrudes through both portions **116** and **118** and through slot **70''**. With this construction limiting longitudinal upward and downward movements of the cleaning wire **24''** and weight **62''** against stem **40''** is provided to enable the same possible wire displacements as is described in foregoing FIG. 5.

The vent system **22''**, which is being used, is described in the Bok patent application Stylographic Writing Pen With Vented Reservoir Within the Writing Nib, filed Apr. 23, 1969 (Ser. No. 818,712) now abandoned, whereby instead of the illustrated blade spring construction **120**, **122** and **124** other constructions for the lower and upper

springs such as wired springs can be used. Hereby venting of the ink reservoir, which is mainly part of the writing nib **16''** occurs in the shown rest position for the vent stem **40''** with open vent **44''**. By moving the knob **52''**, which protrudes through the longitudinal slot **126** of the side wall of the vent housing, midway to its top position, closing of the vent opening **44'** takes place by means of the valve part **130** of the vent stem **40''**.

Other profiles of the vent stem **40''** are possible as they are within the scope of the invention.

I claim:

1. A stylographic pen including:

(A) a barrel;

(B) an ink reservoir having a venting passage in its upper portion and contained within said barrel;

(C) a vent stem reciprocable within said barrel so as to extend through said venting passage and into said reservoir;

(D) a pen tip supported at the end of the barrel and communicant with said reservoir via an ink capillary passageway;

(E) a cleaning wire engageable with the end of said vent stem within said reservoir and extending into said ink capillary passage, said cleaning wire being longitudinally displacable within said passage upon shaking of said pen.

2. Stylographic pen as in claim **1**, wherein the connection between vent stem and cleaning wire is suspended to provide in the writing position of the pen such a thrust on the cleaning wire as to remove the cleaning wire longitudinally from the vent stem over a limited distance.

3. Stylographic pen as in claim **2**, in which the cleaning wire is secured to a weight which is reciprocably supported within the vent stem to enable longitudinal displacement of the cleaning wire against the vent stem.

4. Stylographic pen as in claim **3** including a lower compression spring within said barrel, the spring acting as base whereupon the vent stem rests under the provision of a rest position for the vent stem wherein the cleaning wire is forced to protrude through the pen tip, and whereby downward movement of the vent stem from rest position is possible against the upward thrust of said lower compression spring.

5. Stylographic pen as in claim **4**, including: an upper compression spring, supported in said barrel against the vent stem, whereby upon longitudinal displacement of the vent stem, said upper compression spring provides a downward thrust upon said vent stem.

6. Stylographic pen as in claim **5**, the lower and upper compression springs provide a balanced rest position for the vent stem wherein the cleaning wire may protrude through the pen tip bottom.

7. Stylographic pen as in claim **6**, including: a venting segment of the stem and a scraper, supported in the barrel above said vent, over which scraper during a longitudinal movement of the vent stem, at least part of the venting segment of the vent stem slides.

8. Stylographic pen as in claim **7** whereby in the balanced rest position of the vent stem the vent is closed and a longitudinal upward displacement of the vent stem from this rest position provides the opening of said vent passage.

9. Stylographic pen as in claim **7**, in which the vent stem is configured in part of reduced cross section so that in balanced rest position of the vent stem, the vent is closed and whereby a longitudinal downward displacement of the vent stem from said rest position, the stem opens said vent passage.

10. Stylographic pen as in claim **7** in which a portion of the vent stem is exposed in the balanced rest position, so that the corresponding vent passage is open and whereby upon partial upper displacement from the rest position, the top portion of the vent stem closes the vent passage.

11. Stylographic pen as in claim **10**, the venting seg-

ment having such minimal length, that in ultimate depression thereof, the scraper positions adjacent said venting segment.

12. Stylographic pen as in claim **11**, the venting segment having such length that in top position of the stem the scraper is adjacent said venting segment.

13. Stylographic pen as in claim **12**, whereby the top compression spring comprises part of the scraper as an upper extension thereof.

14. Stylographic pen as in claim **13**, whereby the lower compression spring is part of the scraper as a lower extension thereof.

References Cited

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LAWRENCE CHARLES, Primary Examiner