

# RESERVE COPY

## PATENT SPECIFICATION



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PROVISIONAL SPECIFICATION

### Improvements in or relating to Stylographic Pens

We, MENTMORE MANUFACTURING Co. LIMITED, a Company registered under the laws of Great Britain, and ARTHUR EDWARD ANDREWS, a Subject of the King of Great Britain, both of Tudor Grove, Well Street, Hackney, London, E.9, and WILLIAM FREDERICK JOHNSON, a Subject of the King of Great Britain, of 13, Merrick Square, London, S.E.1, do hereby declare the nature of this invention to be as follows:—

This invention relates to stylographic pens and is concerned more particularly, although not exclusively, with stylographic pens of the self-filling type.

In the stylographic pens heretofore known the feed wire extending axially through the point section is guided adjacent to its free end in a fine-bore tube of non-corrodible material, usually metal, which constitutes the writing point. This small tube is relatively short and is inserted in the nose of the point section of the pen which is usually of a material such as vulcanite. It requires great skill and care to fit the tube satisfactorily since, if it becomes loose or assumes an inclination relatively to the axis of the point section, the feed wire cannot move freely within the tube and the flow of ink to the point of the latter is impeded or disturbed. In addition, the point section is easily broken so that the tube falls out and/or the pen becomes useless.

The feed wire itself is, in some cases, constantly urged outwardly by a spiral spring to which it has been formed at its inner end and, in other cases, urged outwardly (downwardly) when the pen is in use by a weighted feed bar mounted within the the point section and carrying the said feed wire.

Where self-filling pens are concerned it is necessary to provide air vents or the like in the point section to facilitate the filling of the pens and the provisions usually made are of a complicated nature requiring skilled labour and a number of different operations for their satisfactory application.

An important object of the present invention is to provide improvements in

the construction of stylographic pens, particularly in the writing point and the parts associated therewith, which shall greatly simplify and cheapen the assembly and improve the efficiency of the pens.

According to one feature of this invention, therefore, a stylographic pen is characterised by the fact that both the point section and the fine-bore tube constituting the writing point are formed as one integral part from a non-corrodible material, for example stainless steel.

According to another feature of the invention, a stylographic pen comprises a writing point formed integrally with a point section which is adapted to fit into and be frictionally retained in a reduced portion of a bore in the carrier section of the pen, the said bore opening to the atmosphere at the free end of the carrier section and the point section being formed with an aperture or apertures affording communication between its interior and the said bore.

Yet a further feature of the invention is the use of a weighted feed bar carrying the usual feed wire and formed with longitudinally extending grooves. The feed bar is preferably a close, but not frictional, fit in the interior of the point section and may be prevented from falling into the ink reservoir by forming or providing the carrier section of the pen with inwardly directed abutments adapted to engage the end of the feed bar.

The nature of the invention will be clearly understood from the following description of one way in which it may be carried into effect, given solely as an example.

A tubular carrier section is produced from any suitable material, such as a synthetic resin composition, to exhibit an axial bore, an externally coned lower end and an inwardly stepped upper end which may be externally screw-threaded for the first part of its length to engage in the correspondingly threaded mouth of the pen barrel and, in the case of a self-filling pen, may be smooth for the remainder of its length to receive an ink-

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sac. The lower or "mouth" end of the axial bore in the carrier section is of slightly larger diameter than the upper or "ink-reservoir" end, such larger diameter persisting for, say, about  $\frac{1}{3}$  or  $\frac{1}{2}$  of the length of the bore.

A hollow thin-walled point section is formed in one piece, preferably by a drawing operation, from a non-corrodible metal which is most advantageously stainless steel, and exhibits a "point" constituted by a small diameter fine-bore tube, an intermediate conical portion and an upper cylindrical portion. The external diameter of the latter is such that it may fit tightly into and be frictionally held in the lower end of the narrower portion of the bore in the carrier section and means, such as a stop shoulder may be formed or provided in the bore to limit the extent to which the point section is introduced. The length of the cylindrical portion of the point section is preferably such that, when engaged in the carrier section, at least the conical portion of the point section projects beyond the latter. One or more apertures is or are formed through the wall of the said cylindrical portion at a location such that it or they will afford communication between the interior thereof and the annular space between the exterior of the point section and the larger diameter bore in the carrier section. Such communication is preferably established at or adjacent to the inner end of the said annular space.

Within the point section is located a feed-bar which is preferably of heavy construction and has the feed wire directly secured therein. A preferred construction has a cylindrical rod of lead formed with longitudinally extending grooves which may increase slightly in depth in the direction away from the feed wire. The rod is tapered somewhat at the end where the axial feed wire is inserted, to conform to the internal shape of the conical portion of the point section, and is preferably similarly tapered at the opposite end, the grooves extending over the tapered faces also. The lead may be cast to shape and the wire may have its one end embedded therein during this operation. The diameter of the feed-bar is slightly less than the internal diameter of the point section so that it fits closely to the latter while being free to slide therein. The grooves co-operate with the wall of the point section to constitute capillary passages. With the pen held point downwards the feed wire projects slightly through the "point" of the point section.

In order to prevent the feed-bar from

falling into the ink-reservoir when the pen is held point upwards, the inner end of the carrier section is preferably formed with one or more stop members extending part-way across the bore therein. Such members may be produced by arranging for the bore in the carrier section to terminate just short of the inner end thereof and forming a conical depression in the outer face of the solid end thus left to such a depth that the inner face is broken through and an aperture of less diameter than the feed-bar is formed therein. To improve the flow of ink the conical wall of the depression may be formed with radial grooves or saw-cuts which divide the annular stop member into two or more sector-shaped parts.

In the assembly of the pen, the ink-sac (when provided) is first engaged over the end of the carrier section and this is screwed into the barrel. The feed-bar is inserted into the bore of the carrier section so that its flat end rests on the stop members therein and the point section is engaged over the projecting end of the feed-bar and forced into frictional engagement with the bore of smaller diameter in the carrier section.

In use, a slight writing pressure on the point of the feed wire causes this to recede into the tubular "point" of the point section and ink flows from the reservoir of the pen, through the capillary passages between the feed-bar and the interior of the point section, to the writing point. The tapered ends of the feed-bar, and the fact that the grooves extend to the extreme points of these, ensure that the ink will be picked up very readily from the ink-reservoir and conducted directly on to the feed wire, respectively. Easy flow of ink, without flooding, is ensured by slow entry of ink-replacing air through the narrow annular passage between the point section and the larger diameter bore in the carrier section and thence through the aperture in the point section and one or more of the grooves in the feed-bar, to the ink-reservoir. When the pen is of the self-filling type, filling is effected by immersing the lower end of the carrier section in ink and collapsing and expanding the ink-sac. Air is expelled from and ink sucked into the latter through the passages through which ink-replacing air passes to the reservoir during the use of the pen.

The one-piece point section according to this invention can be produced and finished at a relatively low cost and the pen can be assembled rapidly by unskilled labour since there is no separate

fine-bore tube to be fixed in place. Another important advantage is that the bore of the "point" of the point section is always in axial alignment with the rest of the section so that the feed wire may always move freely therein and thus ensure a free flow of ink. In addition, the thin-walled construction of the point section allows of a larger diameter feed-bar being employed so that the latter may be made heavier than usual and thus ensure a more certain movement of the feed wire.

It will be understood that the one-piece point section described may be employed in other types of pens than that given as an example above.

In a modification of the invention the point section may be screwed into the bore.

Dated this 18th day of February, 1938.

For the Applicants,

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75, Victoria Street, London, S.W.1,  
Chartered Patent Agents.

## COMPLETE SPECIFICATION

### Improvements in or relating to Stylographic Pens

We, MENTMORE MANUFACTURING CO. LIMITED, a Company registered under the laws of Great Britain, and ARTHUR EDWARD ANDREWS, a Subject of the King of Great Britain, both of Tudor Grove, Well Street, Hackney, London, E.9, and WILLIAM FREDERICK JOHNSON, a Subject of the King of Great Britain, of 13, Merrick Square, London, S.E.1, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to stylographic pens and is concerned more particularly, although not exclusively, with stylographic pens of the self-filling type.

In the majority of the stylographic pens heretofore known, the feed wire extending axially through the conical point section secured to the pen barrel is guided adjacent to its free end in a fine-bore tube of non-corrodible material, usually metal, which constitutes the writing point. This small tube is relatively short and is inserted in the nose of the point section of the pen which is usually of a material such as vulcanite. It requires great skill and care to fit the tube satisfactorily since, if it becomes loose or assumes an inclination relatively to the axis of the point section, the feed wire cannot move freely within the tube and the flow of ink to the point of the latter is impeded or disturbed. In addition, the point section is easily broken, so that the tube falls out and/or the pen becomes useless.

Stylographic pens have, however, been illustrated in the drawings of specifications Nos. 1951/08 and 10318/13 as apparently comprising a conical point section formed in one piece from an unspecified material to present the fine bore passage for the feed wire. If such point sections were produced from the usual

material, namely vulcanite, then the pens would rapidly have become useless owing to wear of the writing point proper.

The present invention is distinguished from these prior proposals in that it relates to stylographic pens of the character (hereinafter referred to as "the character specified") having both a point section of the same form as that employed in a fountain pen, i.e. a tubular section having a relatively wide mouth, and a tubular tip adapted to be engaged in the said mouth and itself carrying the fine-bore tube constituting the writing point.

Various proposals have been made concerning the feed wire in stylographic pens of many types and, in some cases, it is constantly urged outwardly by a spiral spring to which it has been formed at its inner end and, in other cases, it is urged outwardly (downwardly) when the pen is in use by a weighted feed bar mounted within the point section and carrying the said feed wire.

Where self-filling pens are concerned it is necessary to provide air vents or the like in the point section to facilitate the filling of the pens and the provisions usually made are of a complicated nature requiring skilled labour and a number of different operations for their satisfactory application.

An important object of the present invention is to provide improvements in the construction of stylographic pens of the character specified, particularly in the writing point and the parts associated therewith, which shall greatly simplify and cheapen the assembly and improve the efficiency of the pens.

According to one feature of this invention, therefore, a stylographic pen of the character specified is characterised by the fact that the tubular tip and the fine-bore tube constituting the writing point

are formed as one integral part from a non-corrodible material, for example stainless steel.

According to another feature of the invention, a stylographic pen of the character specified comprises a writing point formed integrally with a tubular tip which is adapted to fit into and be frictionally retained in a bore in the point section of the pen, the said bore opening to the atmosphere at the free end of the point section and the tip being formed with an aperture or apertures affording communication between its interior and the said bore.

Yet a further feature of the invention is the use of a weighted feed bar carrying the usual feed wire and formed with longitudinally extending grooves. The feed bar is preferably a close, but not frictional, fit in the interior of the tip and may be prevented from falling into the ink reservoir by forming or providing the point section of the pen with stop means adapted to engage the end of the feed bar.

One manner in which the invention may be carried into effect will now be described by way of example and with reference to the accompanying drawing, in which:—

Fig. 1 is a longitudinal section of the pen,

Fig. 2 a cross-section on line II—II in Fig. 1, and

Fig. 3 a longitudinal sectional view of the tubular tip and the feed bar withdrawn therefrom.

In the example illustrated, a tubular point section 1 is produced from any suitable material, such as a synthetic resin composition, to exhibit an axial bore 2, 3, an externally waisted or coned lower end 4 and an inwardly stepped upper end which may be externally screw-threaded for the first part 5 of its length to engage in the correspondingly threaded mouth of the pen barrel 6 and, in the illustrated case of a self-filling pen, may be smooth for the remaining part 7 of its length to receive an ink sac 8. The lower part 2 of the axial bore in the point section 1 is of slightly larger diameter than the upper part 3, such larger diameter persisting for, say, about  $\frac{1}{3}$  or  $\frac{1}{2}$  of the length of the bore.

A hollow thin-walled tubular tip 9 is formed in one piece, preferably by a drawing operation, from a non-corrodible metal which is most advantageously stainless steel, and exhibits a "point" 10 constituted by a small diameter fine-bore tube, an intermediate conical portion 11 and an upper cylindrical portion 12. The external diameter of the

latter is such that it may fit tightly into and be frictionally held in the lower or wider part 2 of the bore in the point section 1, the shoulder 13 formed in the bore serving as a stop to limit the extent to which the tip 9 is introduced. The length of the cylindrical portion 12 of the tip is preferably such that, when engaged in the point section, at least the conical portion 11 projects beyond the said point section. One or more apertures 14 (two are shown) are formed through the wall of the said cylindrical portion 12 at a location such that they will afford communication between the interior thereof and an annular space 15 formed around the exterior of the tip by a recess of larger diameter in the point section 1. Such communication is preferably established well within the annular space 15 and, if desired, at or adjacent to the inner end thereof. The outer end may be flared slightly as shown in Fig. 1.

Within the tip 9 is located a feed-bar 16 which is preferably of heavy construction and has the feed wire 17 directly secured therein. A preferred construction has a feed-bar 16 in the form of a cylindrical rod of lead with longitudinally extending grooves 18 which may, if desired, increase slightly in depth in the direction away from the feed wire 17. The rod is tapered somewhat at the end 19 where the axial feed wire is inserted, to conform to the internal shape of the conical portion 11 of the tip 9, and is preferably similarly tapered at the opposite end 20, the grooves extending over the tapered faces also (Figs. 1 and 3). The lead may be cast to shape and the wire may have its one end embedded therein during this operation. The diameter of the feed-bar 16 is slightly less than the internal diameter of the part 12 of the tip 9, so that it fits closely to the latter while being free to slide therein. The grooves 18 co-operate with the wall of the tip 9 to constitute capillary passages. With the pen held point downwards the feed wire 17 projects slightly through the "point" 10 of the tip (Fig. 1).

In order to prevent the feed-bar 16 from falling into the ink-reservoir 8 when the pen is held point upwards, the inner end 7 of the point section 1 is preferably formed with stop means extending part-way across the bore therein. Such stop means may be produced by arranging for the portion 3 in the point section to terminate just short of the inner end thereof and forming a conical depression 21 and aperture 22 in the outer end of the said section, the aperture 22 being of less diameter than the feed-bar 16. To

improve the flow of ink the conical wall of the depression may be formed, if desired, with radial grooves or saw-cuts (not shown) which divide the annular stop means into two or more sector-shaped parts.

In the assembly of the pen, the ink-sac 8 (when provided) is first engaged over the end 7 of the point section 1 which is then screwed into the barrel 6. The feed-bar 16 is inserted into the bore of the point section so that its end 20 rests on the stop means therein and the tip 9 is engaged over the projecting end 15 of the feed-bar and forced into frictional engagement with the portion 2 of the bore in the point section.

In use, a slight writing pressure on the point of the feed wire 17 causes this to recede into the tubular "point" 10 of the tip and ink flows from the reservoir 8 through the capillary passages 18 to the writing point. The tapered ends 19, 20 of the feed-bar, and the fact that the grooves extend to the extremities of these, ensure that the ink will be picked up very readily from the ink-reservoir and conducted directly on to the feed wire 17, respectively. Easy flow of ink, without flooding, is ensured by slow entry of ink-replacing air to the reservoir through the narrow annular space 15, the aperture 14 in the tip 9 and one or more of the grooves 18 in the feed-bar. When the pen is of the self-filling type, filling is effected by immersing the lower end of the point section 1 in ink and collapsing and expanding the ink-sac 8. Air is expelled from and ink sucked into the latter through the passages through which ink-replacing air passes to the reservoir during the use of the pen.

The one-piece tip 9 according to this invention can be produced and finished at a relatively low cost and the pen can be assembled rapidly by unskilled labour since there is no separate fine-bore tube to be fixed in place. Another important advantage is that the bore of the "point" 10 of the tip is always in axial alignment with the rest of the tip so that the feed wire 17 may always move freely therein and thus ensure a free flow of ink. In addition, the thin-walled construction of the tip allows of a larger diameter feed-bar 16 being employed so that the latter may be made heavier than usual and thus ensure a more certain movement of the feed wire.

In a modification of the invention, the tip 9 may be screwed into the bore in the point section 1.

Having now particularly described

and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. Stylographic pen, particularly a self-filling stylographic pen, of the character specified, wherein the tubular tip and the fine-bore tube constituting the writing point itself are formed as one integral part of non-corrodible material.

2. Stylographic pen, particularly a self-filling stylographic pen of the character specified, comprising a writing point formed integrally with a tubular tip which is adapted to fit into and be frictionally retained in a bore in the point section of the pen, the said bore opening to the atmosphere at the free end of the point section and the tip being formed with an aperture or apertures affording communication between its interior and the said bore.

3. Stylographic pen according to claim 1 or 2, wherein the integral point and tip are made of stainless steel.

4. Stylographic pen according to any one of claims 1—3, wherein the usual feed wire is carried by a weighted feed bar formed with longitudinally extending feed grooves.

5. Stylographic pen according to claim 4, wherein the feed bar is guided with a close but not frictional fit in the interior of the tubular tip.

6. Stylographic pen according to claim 4 or 5, wherein the feed bar is prevented from falling into the ink reservoir by the provision in the point section of the pen of stop means adapted for engaging the end of the feed bar.

7. Stylographic pen according to any one of claims 2—6, wherein an annular space is formed between the interior of the point section where the bore in the latter opens to the atmosphere and the tip and the aperture or apertures are arranged to afford communication between the interior of the tubular tip and the said space.

8. Stylographic pen according to any one of claims 4—7, wherein the feed bar is formed with conical ends and the longitudinal feed grooves extend over the conical ends.

9. The stylographic pen substantially as described with reference to the accompanying drawing.

Dated this 5th day of October, 1938.

For the Applicants,  
RAWORTH, MOSS & COOK,  
75, Victoria Street, London, S.W.1,  
Chartered Patent Agents.

[This Drawing is a reproduction of the Original on a reduced scale.]

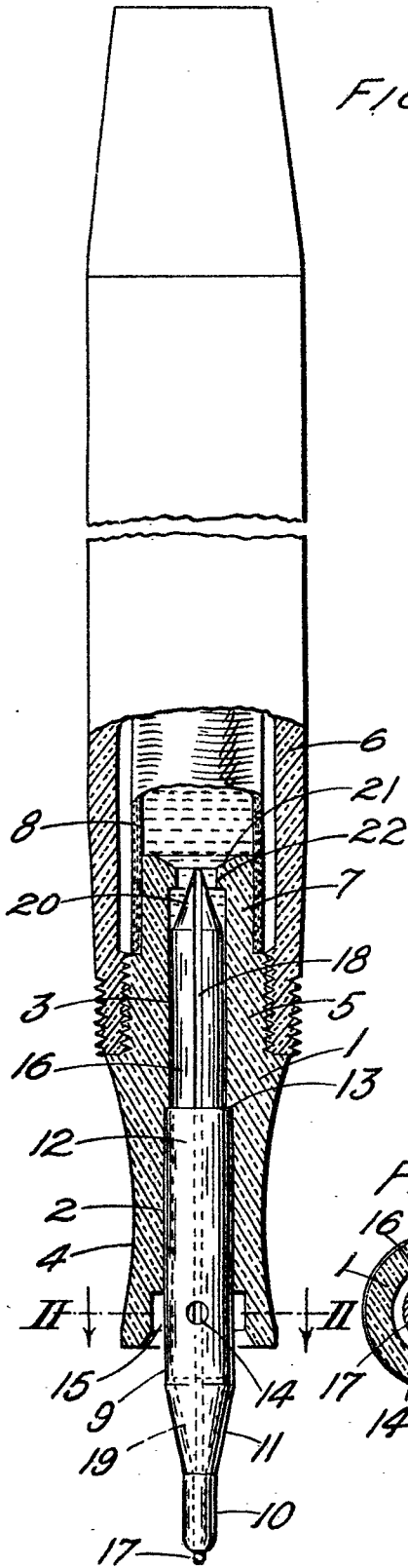


FIG. 1.

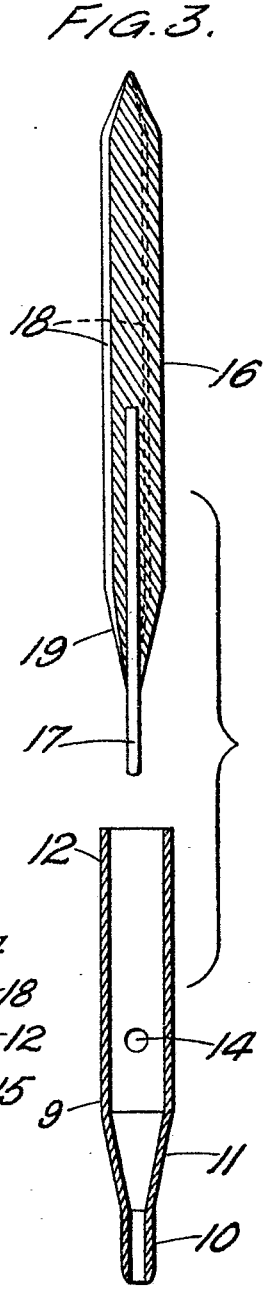


FIG. 2.

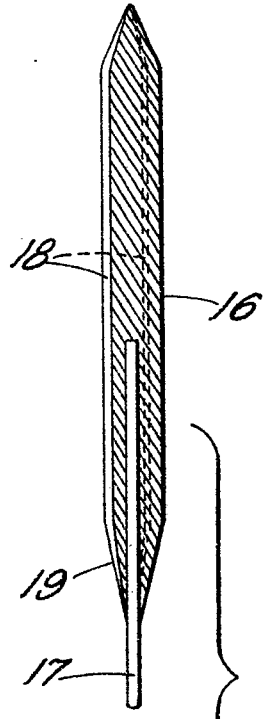


FIG. 3.