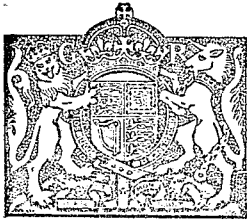


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PATENT SPECIFICATION

373,123



Application Date: Jan. 16, 1931. No. 1520/31.

" " Sept. 11, 1931. No. 25,538/31.

One Complete Left: Oct. 16, 1931.

Complete Accepted: May 17, 1932.

PROVISIONAL SPECIFICATION.

No. 1520, A.D. 1931.

Improvements in or relating to Pen Nibs.

We, ARTHUR GILBERT, a Subject of the King of Great Britain, and MENTMORE MANUFACTURING COMPANY LIMITED, a Company registered under the laws of Great Britain, both of Tudor Grove, Well Street, in the Metropolitan Borough of Hackney, do hereby declare the nature of this invention to be as follows:—

This invention relates to pen nibs which are particularly though not exclusively formed of a nickel chrome or a nickel chrome iron alloy such as stainless steel or the material known under the registered trade mark "Staybrite"; thus it may be applied to nibs of gold or other metal.

It is desirable that pen nibs used in fountain pens should have a point of a hard metal, such as iridium or like hard metal or alloy (hereinafter referred to as iridium) so as to overcome the difficulties of wear of the pen nib, but it has heretofore been found impossible to apply a point of iridium to pen nibs of nickel chrome or nickel chrome iron alloys of the kind referred to above, and in other cases it has been difficult to obtain the result desired in, for example, the shape or disposition of the iridium. This has been so with nibs of gold the iridium having been applied by fusing with an oxy-gas flame and the assistance of a flux. In such a method it is found that the iridium is not as firmly applied as is desirable and it is impossible to divide the point by shearing.

According to the present invention the difficulties heretofore experienced have been overcome by carrying out the fusing operation under pressure.

According to the present invention therefore a method of applying an iridium point to a pen nib, for example, of a nickel chrome or nickel chrome iron alloy of the kind described, consists in welding iridium to the point of the pen nib under pressure and subsequently dividing the iridium on the line of the slit of the nib.

Preferably the welding is effected by an  
[Price 1/-]

electric welding apparatus and the pressure is applied by the upper electrode thereof.

In carrying out a method according to the present invention the lower electrode of the electric welding apparatus is provided with a cavity of the shape which is desired for the iridium when it has been applied to the point of the pen nib. A piece of the metal or alloy is placed in the cavity which is of such a size that the metal extends above it, the pen nib, either in the form of a blank, or shaped, or it may be shaped and not slit, is placed with its point over the cavity and the upper electrode is moved down on to the top of the point of the pen nib whereby current flows from the upper to the lower electrode in the usual way. By means of the upper electrode pressure is applied to the pen nib during the welding operation and the iridium is caused to take the shape of the cavity. The pen nib is then removed with the iridium point fixed and the iridium is divided on the line of the slit of the nib.

The dividing of the iridium may be effected by a fine cutting wheel to which an abrasive material is applied and it will be understood that the point may be applied before the blank is slit and the slitting effected when the iridium is divided.

By varying the shape of the cavity in the bottom electrode or support for the pen nib any desired shape or disposition of the iridium point may be obtained.

By the method according to the present invention it is found that the iridium is so securely applied to the nib that it may be sheared in the usual way instead of being cut.

Dated this 15th day of January, 1931.

ARTHUR GILBERT,  
For and on behalf of  
MENTMORE MANUFACTURING  
COY. LTD.,  
A. GILBERT  
Managing Director.

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## PROVISIONAL SPECIFICATION.

No. 25,538, A.D. 1931.

**Improvements in or relating to Pen Nibs.**

We, ARTHUR GILBERT, a Subject of the King of Great Britain, and MENTMORE MANUFACTURING COMPANY LIMITED, a Company registered under the laws of Great Britain, both of Tudor Grove, Well Street, in the Metropolitan Borough of Hackney, do hereby declare the nature of this invention to be as follows:—

The present invention concerns improvements in or relating to pen nibs, more particularly though not exclusively to those that are formed of a nickel-chrome or a nickel-chrome-iron alloy, for example, stainless steel or the material known under the registered trade mark "Staybrite"; the invention may be applied to nibs of gold or other metal. The present invention may in certain aspects be regarded as an improvement in or modification of the invention described in the specification of our prior application for Letters Patent No. 1520 dated 16th January, 1931, and will be described illustratively in connection with a method as referred to in the said prior specification.

It is desirable that pen nibs used in fountain pens should have a point of a hard metal, such as iridium or like hard metal or alloy (hereinafter referred to as iridium) so as to overcome the difficulties of wear of the pen nib. As explained in the prior specification hereinbefore referred to it was, before the date of that specification, found impossible to apply a point of iridium to pen nibs of nickel-chrome, or nickel-chrome-iron alloy of the kind hereinbefore referred to, and in other cases it was difficult to obtain the result desired in, for example, the shape or disposition of the iridium. This was so with nibs of gold, the iridium having been applied by fusing with an oxy-gas flame and with the assistance of a flux. In such method it is found that the iridium is not as firmly applied on the pen nib as desirable and that it is impossible to divide the iridium point, after application, by shearing.

The prior specification hereinbefore referred to disclosed a method of applying an iridium point to a pen nib in such a

way as to overcome the difficulties theretofore experienced, the iridium point being applied to the pen nib by welding under pressure, and the iridium being subsequently divided on the line of the slit of the nib.

According to the present invention the iridium point is applied in such a manner that it assumes a form which provides a slight cell or pocket between part of the iridium point and the adjacent part of the pen nib. This pocket forms a trap for a small amount of ink and assists the even flow of the ink to the part of the point that contacts with the paper, and may prevent or decrease liability to flooding.

The shape of the cavity in the adjacent electrode may be modified to assist in the formation of such a cell or pocket.

An iridium point applied according to the invention is found to be harder than a similar point applied by usual methods; this is evidenced by the grinding operation which takes longer than previously.

In carrying out the aforementioned illustrative method the steps are generally the same as those described in the aforementioned specification. The shape of the cavity in the electrode adjacent the under surface of the pen nib is such that the iridium point is formed on its under side with a small rounded blob or elongated globule, and between the curved rear end of the blob and the adjacent under side of the nib there is formed a very small more-or-less V-shaped cell or pocket. In use ink flowing down the slit in the nib flows into this pocket which thus forms a trap or reservoir that assists in the even flow of the ink to the paper and may prevent flooding.

The iridium point may fuse during the welding operation and subsequently solidify to provide the cell or pocket.

Dated this 10th day of September, 1931.

ARTHUR GILBERT,  
MENTMORE MANUFACTURING  
CO. LIMITED.

For and on behalf of  
Mentmore Manufacturing Coy. Ltd.,  
A. GILBERT,  
Managing Director.

## COMPLETE SPECIFICATION.

**Improvements in or relating to Pen Nibs.**

We, ARTHUR GILBERT, a Subject of the King of Great Britain, and MENTMORE

MANUFACTURING COMPANY LIMITED, a Company registered under the laws of

Great Britain, both of Tudor Grove, Well Street, in the Metropolitan Borough of Hackney, 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:—

The present invention concerns improvements in or relating to pen nibs that are formed of a nickel-chrome or a nickel-chrome-iron or other chrome alloy, for example, stainless steel or the material known under the name "Staybrite". The invention will be described illustratively in connection with one illustrative method of forming a pen nib of an alloy as just referred to.

It is desirable that pen nibs used in fountain pens should have a point of a hard metal, such as iridium or like hard metal or alloy (hereinafter referred to as iridium) so as to overcome the difficulties of wear of the pen nib. It has heretofore been found impossible to apply a point of iridium to pen nibs of nickel-chrome, or nickel-chrome-iron alloys of the kind hereinbefore referred to, and in other cases it was difficult to obtain the result desired in, for example, the shape or disposition of the iridium. This has been so even with nibs of gold, iridium having been applied by fusing with an oxy-gas flame and with the assistance of a flux. In such method it is found that the iridium is not as firmly applied on the pen nib as desirable and that it is impossible to divide the iridium point, after application, by shearing.

According to the present invention the difficulties heretofore experienced have been overcome by carrying out the fusing or welding operation under pressure.

One feature of the invention is concerned with a method of applying an iridium point to a pen nib of nickel-chrome or nickel-chrome-iron or other chrome alloy which method comprises welding iridium to the point of the pen nib under pressure and subsequently dividing the iridium on the line of the slit of the nib, the body of the nib being slit either previously to the welding or thereafter at the same time as the iridium. Preferably the welding is effected by an electric welding apparatus and the pressure is applied by the upper electrode thereof.

Another feature of the invention is concerned with a method of applying an iridium point to a pen nib of a nickel-chrome or nickel-chrome-iron or other chrome alloy which method comprises fixing the iridium to the nib in such a manner that there is provided a slight cell or pocket between the rear part of the

iridium and the adjacent surface of the pen nib. This pocket forms a trap for a small amount of ink and assists the even flow of ink to the part of the point which contacts with the paper; it also prevents or decreases liability to flooding.

Preferably in order to increase the length of the pocket the end of the pen nib before the application of the iridium point is bent upwardly into such a position that its extreme end lies parallel or substantially so with the adjacent surface of the nib but somewhat upwardly therefrom, the term "upwardly" being used to denote away from the line of the concave surface of the nib.

The shape of the cavity in the electrode adjacent the pocket may be modified to assist in the formation of such a cell or pocket.

The various objects and the several features of the invention will become apparent to those skilled in the art from the following description, in conjunction with the accompanying diagrammatic drawings, of a pen nib constructed according to the aforementioned illustrative method.

In the drawings,

Fig. 1 shows a pen nib blank composed of metal of the kind described and in its unslit condition;

Fig. 2 shows the nib of Fig. 1 in side elevation, an iridium point being indicated in chain lines;

Fig. 3 shows the nib of Fig. 1 after its extreme end has been bent up;

Fig. 4 shows the nib of Fig. 3 after the iridium point has been welded thereto; and

Fig. 5 shows the complete pen nib after it has been slit.

In carrying out the aforementioned illustrative method a pen nib 1 as indicated in Fig. 1 is formed in usual manner except that it has a rather wide and slightly shouldered end 3. This facilitates the application of the iridium. Thereafter the writing end 3 of the nib is bent upwardly as shown in Fig. 3.

The lower electrode of an electric welding apparatus is provided with a cavity of approximately the shape which it is desired that the iridium when it has been applied to the end 3 of the pen nib 1 shall take. A piece of the iridium 5 is placed in the cavity which is of such size that the iridium extends somewhat above it. The unslit pen nib is then placed with its writing end 3 over the cavity and the upper electrode is moved down on to the top of the end 3 whereupon current flows from the upper to the lower electrode in the usual way. By means of the upper electrode pressure is applied to the pen

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nib during the welding operation and the lower part 7 of the iridium is caused to take the shape of the cavity in the lower electrode. The pen nib is then removed with the iridium point fixed thereto and the iridium and the nib is divided on the line 9 of the slit of the nib; the end 11 of the point is rounded and polished.

If desired the iridium may be attached to the nib of Fig. 1 as indicated at 15 in Fig. 2; it is preferred however, to bend up the end of the nib first as in Fig. 3. It will be noticed that when the iridium is applied to the bent-up end of the nib, the iridium is partly above the general line of the lower or concave surface of the nib.

The dividing of the iridium 5 may be effected by a fine cutting wheel to which an abrasive material is applied, the slitting of the nib being effected at the same time. It will be understood, however, that it may be preferred to slit the nib first and apply the iridium to the slit nib, in which case only the iridium would remain to be divided.

By varying the shape of the cavity in the bottom electrode any desired shape or disposition of the iridium point 5 relatively to the pen nib 1 may be attained. In the present case the shape of the cavity in the electrode adjacent the under surface of the pen nib is such that the iridium point is formed on its underside as a small rounded blob or elongated globule, and between the curved rear end of the blob and the adjacent inside of the nib there is formed a very small more-or-less V-shaped cell or pocket 13. It will be observed that by the bending of the end of the nib upwardly the extent of this cell 13 is increased and its shape is modified.

In use, ink flowing down the slit 9 in the nib flows into this pocket 13 which thus forms a trap or reservoir that assists in the even flow of the ink to the paper and also assists in the starting of the flow of the ink when the pen is first used after an interval. Indeed, the nib commences to discharge ink as soon as the point is applied to the paper and normal pressure applied. This cell has also a tendency to prevent flooding.

It is found that an iridium point applied by a method according to the present invention is so securely applied to

the nib that it may be sheared in the usual way instead of being cut as by grinding.

If desired the nib may be slit as at 17 to facilitate springing of the writing end of the nib to assist in the drawing of the ink along the nib.

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. A method of applying an iridium point to a pen nib of a nickel-chrome or nickel-chrome-iron or other chrome alloy which method comprises welding iridium to the point of the pen nib under pressure and subsequently dividing the iridium on the line of the slit of the nib.

2. A method of applying an iridium point to a pen nib according to Claim 1 in which the weld is effected in an electric welding apparatus and the pressure is applied by the upper electrode thereof.

3. A method of applying an iridium point to a pen nib according to Claim 1 or 2 in which the iridium is placed in a cavity in the lower electrode shaped according to the shape which is desired for the point.

4. A method of applying an iridium point to a pen nib of a nickel-chrome or nickel-chrome-iron or other chrome alloy which method comprises fixing the iridium point to the nib in such a manner that there is provided a slight cell or pocket between the rear part of the iridium and the adjacent under surface of the nib.

5. A method according to any of the preceding claims which comprises bending up the end of the pen nib and thereafter applying the iridium to the bent-up end so that the iridium is partly above the lower surface of the nib.

6. A pen nib formed by a method according to any of the preceding claims.

7. A pen nib with a pocket, formed substantially as described with reference to the accompanying drawings.

Dated this 16th day of October, 1931.

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

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

