June 17, 1952 L. A. PAUL 2,600,426

FOUNTAIN PEN POINT

Filed Nov. 15, 1947

Fig. 1.

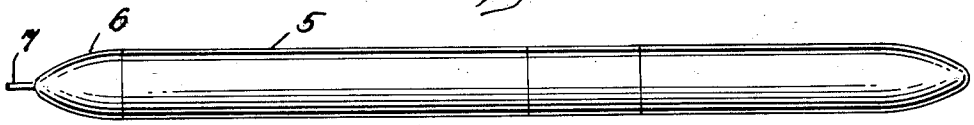



Fig. 2.

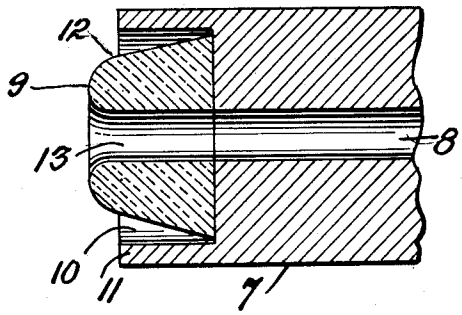



Fig. 3.

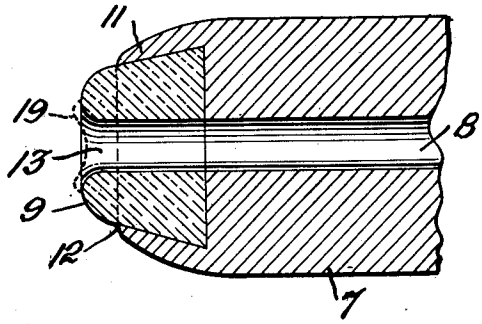
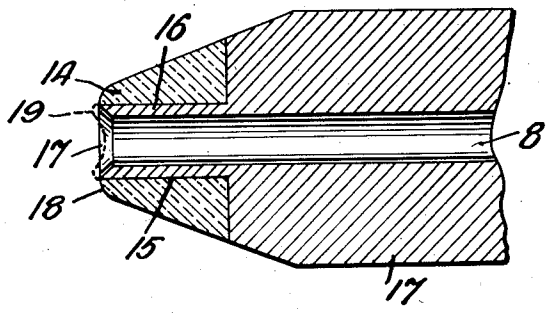



Fig. 4.




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## FOUNTAIN PEN POINT

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Application November 15, 1947, Serial No. 786,179

2 Claims. (Cl. 120—44)

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The invention here disclosed relates to the writing points employed on writing and drawing implements, particularly such as fountain pens.

Special objects of the invention are to provide a writing and drawing point which will glide smoothly over the paper, cardboard, metal, plastic or other surface being drawn or written upon and which can be utilized to accurately apply a continuous line of infinite length and of regular, uniform density and width.

Other important objects of the invention are to provide a pen point having such characteristics and capabilities as can be produced at low cost and which with ordinary use and treatment will last practically indefinitely.

Other special objects of the invention are to provide a pen point as indicated which will be non-scratching and non-chattering and which will not require sharpening or other attention or servicing.

Other desirable objects attained by the invention are set forth or will appear in the course of the following specification, wherein the various novel features of the invention are particularly pointed out and broadly claimed.

The drawing accompanying and forming part of the specification illustrates different practical embodiments of the invention but structure may be further modified as regards such illustration, all within the true and intended scope of the invention as hereinafter defined and claimed.

Fig. 1 in the drawing is a side elevation of a fountain pen having the invention incorporated therein;

Figs. 2 and 3 are greatly enlarged broken sectional views of the pen point structure, Fig. 2 illustrating the point in course of manufacture and Fig. 3 showing the point in completed form;

Fig. 4 is a broken sectional detail of a modified form of the point.

The pen shown in Fig. 1 may be of the general type disclosed in copending patent application Serial No. 740,055, filed April 8th, 1947, now Patent 2,495,179, and embodying in general, a pen barrel 5 containing an ink reservoir and having at one end a cap 6 carrying a capillary tube writing point 7.

The structure of the capillary tube is shown in Figs. 2 and 3, comprising the tubular portion 7 preferably of small external dimensions but of a size and material to be strong and rigid enough for ordinary drawing and writing purposes. This tubular element has a capillary bore 8 therethrough.

The writing or contact end of the tube is formed by a jewel ring 9 secured with the passage therethrough in line with or forming a continuation of the capillary passage in the tube.

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In the first embodiment of the invention the jewel ring or annulus is seated in a cavity 10 formed in the end of the tube and secured in that relation by spinning the cylindrical wall 11 of the cavity over the side of the jewel, substantially as shown in Fig. 3.

For greater security, the jewel is shown as having a tapered side wall 12, giving it a frusto-conical shape which enables the confining wall to hold it the more securely in position.

In the form of construction under consideration, with the annular jewel secured at the end of the capillary passage 8, the passage 13 through the jewel may be of the same capillary dimensions as passage 8 in the tube 7.

Other methods of mounting the jewel may be employed.

Thus, as shown in Fig. 4, the jewel here designated 14 is made with a bore 15 large enough for it to slip over a reduced and thinned extension 16 of the tubular member 17.

The jewel may be secured in this position over the tubular extension 16 by cement or the like or by simply a pressed fit, or mechanical means may be employed such as would be accomplished by slightly expanding the end of the tube.

The tubular neck extension 16 over which the jewel is engaged, is shown in Fig. 4 as having a beveled or flared end portion 17 and the extreme end of this metal portion preferably is lower than, or at least does not extend beyond the tangent curve portion 18 of the jewel.

This is for the purpose of letting the ink, writing or drawing fluid through the capillary passage 8 clear out to the tangent surface of the jewel. This action is based on the fact that the ink forming fluid has an affinity for or is attracted to the smooth, hard surface of the jewel.

The dotted line at 19 indicates in a general way the formation of the meniscus produced by the surface tension at the end of the bore, this meniscus, in effect, bridging across the tangent circle of the jewel.

In the form of the invention first illustrated the meniscus effect is the same, as shown in dotted lines at 19, extending clear across the tangent circle of the jewel.

This contact surface in each case is rounded substantially in semi-toroidal form. In the first construction the semi-toroidal formation is provided entirely by the jewel, and the second form illustrated shows how a portion of such surface,

at the inside where no contact is made, may be provided, in effect, by an end wall of the tubular metallic support on which the jewel is mounted.

In both forms of construction the meniscus is drawn across the tangential end of the semi-toroidal formation of the jewel and this substantially determines the width of the line which the instrument will draw or write. However, by rocking the implement to different slanting positions the width of the line may, to some extent, be controlled and maintained as desired.

The jewel may be a ring of sapphire, that is, synthetic corundum, but jewels of ruby, glass and other such hard, smooth materials may be employed.

The jewel ring causes the writing point to glide smoothly and uninterruptedly over the writing surface without scratching or chatter, even though the writing surface be somewhat rough or irregular.

The constructions disclosed provide also a substantially everlasting writing point which will not wear appreciably with use. Due to the extreme hardness of the synthetic sapphire or corundum, it is possible to flame harden or polish the point to a smoothness which will enable the point to glide over the writing surface practically without effort. The pen, therefore, can be operated with a light touch and fast moving strokes, facilitating high speed, high production work.

The jewel ring point is suited to handling various inks. In particular, it is well adapted to using quick drying lacquers and these are a factor in the high speed use of the instrument, since such inks dry almost instantly, enabling lines to be immediately drawn over other lines without having to wait for the first to dry.

While the jewel ring usually is quite small, it is firmly and strongly mounted and therefore requires no special care in the handling of the pen. The structure, in addition to being rugged in character, is relatively simple and can be produced at reasonably low cost.

In both forms of the invention shown, the larger diameter end of the frusto-conical jewel forms a substantially firm base for carrying any thrust and for overcoming any forces tending to tilt the jewel in or on its seat at the end of the feed tube.

What is claimed is:

1. A fountain pen point comprising a feed tube having a reduced tubular neck extension at the end of the same and an annular jewel engaged over said neck extension and having a rounded annular bearing end about the end of said reduced extension.

2. A fountain pen point comprising a feed tube having a reduced tubular neck extension at the end of the same and an annular jewel engaged over said neck extension and having a rounded annular bearing end about the end of said reduced extension, the end of said tubular neck extension being flared outwardly toward said rounded bearing portion of the surrounding jewel.

LEWIS A. PAUL.

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