INK WRITING IMPLEMENT

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8 Claims. (Cl. 120—S)

The present invention relates to an improved ink writing implement. This implement consists of a conical plastic pen point fitted to a pen core.

Reliable ink flow without skipping, blotting or leaking has long been a problem in ink writing implements. It has been difficult to devise sturdy pen points which will write with ease on a variety of different materials. Previously, sturdy pen points have been incapable of producing a fine ink line.

It is the objective of this invention to provide an inexpensive writing implement which will permit controlled flow of ink free from stoppage or excess and which will produce a fine ink line in all directions on various surfaces without blotting or skipping.

It is another objective of this invention to provide a construction for a writing implement having replaceable pen points, which points are capable of being injection molded in large quantities at low cost.

In accordance with the present invention, a replaceable conical plastic pen point is fitted to a pen core and receives ink from an ink chamber through a capillary ink flow control passage within the pen core. The pen core has a finned accumulator to retain any excess ink which may flow through the passage. Thus, ink is available to the pen point from both the capillary passage and the finned accumulator.

In the drawings:

FIGURE 1 is an elevational view, showing the writing implement in section to show the interior of the embodiment of the present invention;

FIGURE 2 is an enlarged elevational view of the section designated A—A in FIG. 1;

FIGURE 3 is a view of the section designated B—B in FIGURE 2;

FIGURE 4 is an enlarged view of the section designated C—C in FIG. 2;

FIGURES 5 and 6 are enlarged elevational cut-away and sectional views, respectively, of another embodiment of the pen point of the present invention;

FIGURES 7 and 8 are enlarged elevational cut-away and sectional views, respectively, of a third embodiment of the pen point of the present invention; and

FIGURES 9 and 10 are enlarged elevational cut-away and sectional views, respectively, of a fourth embodiment of the pen point of the present invention.

In FIGURES 1 through 4, pen core 1 has a central passage 21 and fins 12. The fins 12 receive excess ink from the central passage 21 through slots 22. The slots 22 and the fins 12 serve as an accumulator for excess ink. Conical pen point 2 is preferably made of a plastic such as nylon Delrin (T.M. of Du Pont), or the like. This point 2 is fitted to the pen core 1 by means of a tubular projection 4 which mates with a receptacle 3 in the pen core 1, see FIG. 3. A central passage 5 in point 2 communicates with a plurality of holes 6 in the point which supply ink to a circular circumferential channel 7 on the surface of the point. The circular channel 7 connects with a plurality of longitudinal ink channels 8 which supply ink to the writing tip of the point. Ink is stored in a reservoir or cartridge 9 on one end of the pen core 1. A core rod 10 having a capillary channel 11 is located in the central passage 21 of the pen core 1. Outer jacket parts 29 and 30 are screwed onto threaded portions of the pen core.

In operation, ink from the reservoir 9 flows through the capillary channel 11 in the core rod 10 and through the passage 21 of the pen core 1 to the central passage 5 of the conical pen point 2. From the central passage 5 the ink flows through holes 6 to the circular channel 7 and thence down longitudinal channels 8 to the writing tip of the conical point.

Controlled ink flow is achieved by means of the capillary channel 11 in the core rod 10. Excess ink is retained by the fins 12 to provide point 2 with a constant supply of ink irrespective of the quantity of ink in the reservoir 9. Thus, ink is instantly available to the point at the proper flow rate without danger of blotting or skipping.

The pen point 2 and the cores 1 are preferably separately injection molded from plastic in large quantities.

In the embodiments shown in FIGURES 5 and 6, a central passage 13 communicates with a plurality of slots 14 arranged in a star-shaped pattern. The slots 14 terminate at a solid tip 23 which holds the point together.

A sheath 15 of closely fitted material, preferably a plastic, directs the ink through the slots 14 to the exposed writing tip 23.

In the embodiment shown in FIGURES 7 and 8, a passage 24 communicates with radial holes 25 which supply surface channels 26. A sheath 16 of plastic is closely fitted to the point to direct ink down the surface channels 26 to the exposed writing tip 27.

In the embodiment shown in FIGURES 9 and 10, a central passage 17 communicates with a plurality of radial holes 18 which supply surface channels 19 which extend circumferentially as well as longitudinally. A sheath 20 of plastic is tightly fitted to the point to direct ink through the surface channels 19 to the exposed writing tip 28.

The sheath serves to prevent ink from drying on the point.

Many other embodiments of this invention may be made without departing from the spirit and scope hereof as defined in the appended claims. It is to be understood that the invention is not limited to the specific embodiments disclosed.

1 claim:

1. An ink writing implement including a tubular pen core with a central passage, an ink reservoir fitted to one end of the pen core and in communication with the central passage, and a pen point entirely of molded plastic fitted to the other end of the pen core, said pen point having a plurality of surface ink channels and a plurality of internal passages which connect the central passage of the pen core with the surface ink channels wherein said central passage contains a core rod having a capillary ink flow control channel.

2. The ink writing implement as claimed in claim 1 wherein said pen point has a closely fitted sheath of thin material covering the surface channels.

3. The ink writing implement as claimed in claim 1 wherein the passageways of the pen point are a plurality of radial holes through the body of the pen point which originate at the surface ink channels and terminate in a central passage within the pen point.

4. The ink writing implement as claimed in claim 3 wherein the pen point is encased within a closely fitting thin outer sheath which leaves exposed the writing tip of the pen point.

5. The ink writing implement as claimed in claim 1 wherein the ink channels of the pen point are a plurality of slots which radiate from a central passage within the point to the surface of the pen point, said pen point hav-
3. The ink writing implement as claimed in claim 1 wherein the surface ink channels of the pen point extend longitudinally and circumferentially and the passages of the pen point originate at the intersections of the surface ink channels and terminate in a central passage within the pen point.

4. The ink writing implement as claimed in claim 1 wherein the pen point is encased in a closely fitting thin outer sheath which leaves exposed the writing tip of the pen point.

5. The ink writing implement as claimed in claim 1 wherein the pen core has two external screw threads to which are screwed a top cover and a bottom cover having an end aperture for the pen point.

References Cited by the Examiner

UNITED STATES PATENTS

2,872,899 2/1959 Trespalacios ------- 120—51 X

FOREIGN PATENTS

57,926 1/1953 France.
253,406 11/1912 Germany.
523,712 4/1955 Italy.

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