Nov. 18, 1947. A. E. ANDREWS ET AL 2,431,015

INK RESERVOIR PEN

Filed Oct. 3, 1944

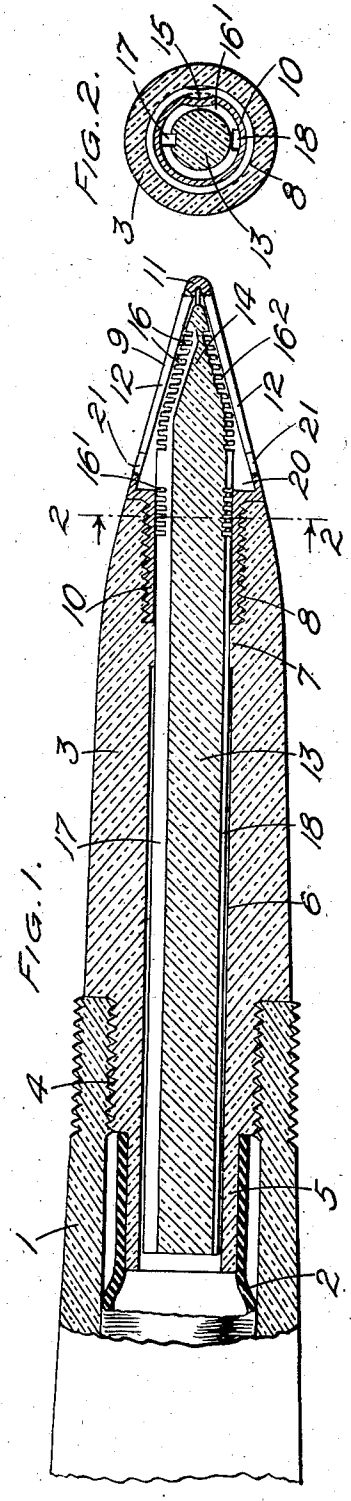

FIG. 1.

FIG. 2.

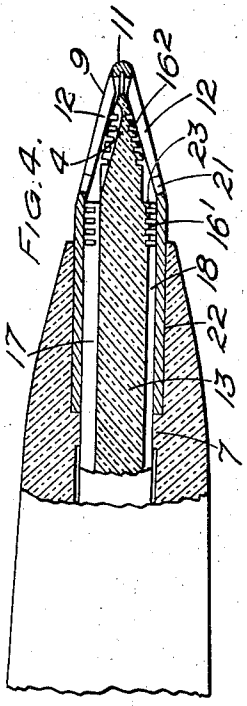

FIG. 4.

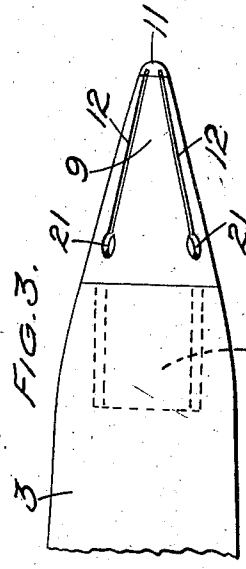

FIG. 3.

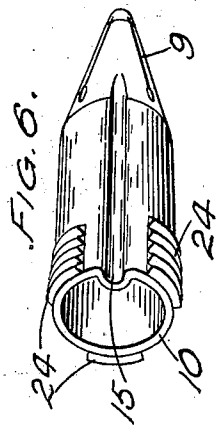

FIG. 6.

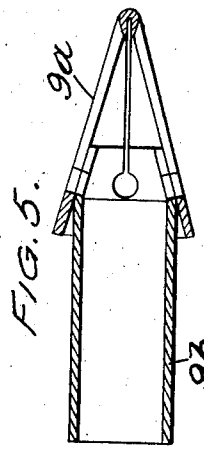

FIG. 5.

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INK RESERVOIR PEN

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9 Claims. (Cl. 120—44)

1

This invention relates to ink reservoir pens of the kind in which the writing point is hollow or tubular as distinct from a pen nib to which point the ink is fed from the reservoir during writing.

Difficulties have been experienced with pens of the kind described in controlling the ink flow and it is an object of the present invention to provide a construction by which such difficulties shall be overcome.

According to the present invention an ink reservoir pen has a hollow point section with a narrow slot or slots extending lengthwise in its wall and an ink regulator member mounted within and close to the wall of the point section and extending to the forward end of the ink reservoir.

Preferably the end of the point section has a continuous surface, the slot or slots through its wall not extending to the tip. Preferably, also, the point section is of a non-corrodible metal, such for example as gold. Gold, however, is unsatisfactory for the actual writing point by reason of its softness. A feature of the present invention therefore consists of a point section having a tip of a hard wearing non-corrodible material such as iridium, or possibly a stainless steel.

One form of ink reservoir pen according to the present invention will now be described by way of example and with reference to the accompanying drawings, wherein—

Fig. 1 shows in section the writing end of one form of pen,

Fig. 2 is a section on the line 2—2 of Fig. 1,

Fig. 3 is an external view of the point section,

Fig. 4 shows, also in section, the writing end of a modified form of pen,

Fig. 5 shows a modified form of point section, and

Fig. 6 a further modification.

Referring to Figs. 1, 2 and 3 the barrel 1 is of vulcanite or other material employed for such purpose and of usual form. Within it is disposed the ink containing sac 2 together with the usual apparatus for collapsing the sac in order to fill it. At the front end of the barrel is a front section 3 which may be of the same material as the barrel and it is secured thereto by co-operating threads 4 in the usual way. The inner end of the front section 3 comprises a short spigot 5 to which the front end of the sac 2 is cemented. The front section 3 is bored from its inner end for a certain distance and this bore 6 connects with a short bore 7 of smaller diameter which in turn connects with a bore 8 of slightly larger diameter extending to the front end of the section. The bore 8 is threaded. The point section 9 is hollow with its front end of conical shape and its rear end 10 tubular and threaded to screw into the bore 8 at the front end of the front section 3. It is of gold or other non-corrodible metal with a tip 11 of iridium or other hard non-corrodible material. Slots 12 for example four and equally spaced extend longitudinally of the point section 9 towards this tip and preferably partly into the iridium point 11. An ink regulator member 13 comprises a rod conveniently of vulcanite which may fit freely within the reduced bore 7 of the front section 5 or may be a friction fit therein. It has a conical forward end 14 to conform to and is mounted close to the inner surface of the wall of the point section 9 and when it fits freely in the reduced bore 7 it is held in place by a longitudinal depression 15 in the wall of the rear part 10 of the point section. This depression 15 forces the ink regulator member 13 against one side of the inner wall of the point section. This ink regulator member has a series of parallel transverse grooves 16 around its front end. These grooves are in two batches 16′ and 16^2 the front batch 16^2 extending as close to the tip as they can conveniently be produced. It also has a narrow longitudinal groove 17 which extends nearly to the tip of the conical forward end below the bottoms of the grooves 16. Diametrically opposite to the groove 17 is another groove 18 which is less deep but wider than the groove 17. This groove 18 extends to just beyond the end of the first batch of grooves 16′ to a portion just inside the point section.

2

The rear end of the point section 9 is of the same diameter as the front end of the front section 3 so that there is no shoulder at the junction of the two and its outer surface forms a continuation of the front section of the pen. The wide groove 18 in the ink regulator member constitutes a passage to supply air to the interior of the sac when ink is fed from it through the narrower groove 17. Air is supplied to the groove 18 from the space 20 at the rear end of the point section. 21 are small holes through the wall of the point section to admit air to the space 20.

In use air is supplied through the holes 21 to the space 20 and thence by the groove 18 to the sac of the pen while ink is delivered from the sac to the narrower groove 17 and thence to the grooves 16 and to the slots 12 whence it flows over the tip 11.

In a modification of the invention shown in Fig. 4 the point section 9 is not shouldered and is frictionally held in the front section 3 as indicated at 22 and the ink regulator member 13 is stepped

at 23. The groove 18 extends to the step 23.

While the construction described has been found satisfactory it will be understood that various modifications may be made without departing from the invention. Thus the point section may be made in two parts 9a, 9b as illustrated in Fig. 5, the two parts being secured together by welding. The threading on the point section, when used may be in a series of separate raised parts as shown at 24 in Fig. 6. The depression 15 then also constitutes an air vent.

We claim:

1. An ink reservoir pen comprising a hollow pen barrel, a hollow writing point section extending therefrom and having a narrow slot extending lengthwise in its wall and a rigid ink regulator member mounted within the point section to extend to the forward end of the ink reservoir for regulating the flow of ink into said point section and through said slot.

2. An ink reservoir pen comprising a hollow pen barrel, a hollow writing point section extending therefrom and having a plurality of narrow slots extending lengthwise in its wall and a rigid ink regulator member mounted within the point section to extend to the forward end of the ink reservoir for regulating the flow of ink into said point section and through said slots.

3. An ink reservoir pen comprising a hollow pen barrel providing an ink reservoir, a hollow writing point section extending therefrom and having a rounded writing tip with a continuous surface and a plurality of slots extending lengthwise in its wall to a point short of the tip, and a rigid ink regulator member mounted within the point section to extend to the forward end of the ink reservoir for regulating the flow of ink from the barrel into the point section and through said slots to the tip.

4. An ink reservoir pen comprising a hollow pen barrel providing an ink reservoir, a hollow writing point section extending therefrom and having a rounded writing tip with a continuous surface and a plurality of slots extending lengthwise in its wall to a point short of the tip and a rigid ink regulator member having a series of parallel transverse grooves around its front end mounted within the point section to extend to the forward end of the ink reservoir for regulating the flow of ink from the barrel into the point section and through said slots to the tip.

5. An ink reservoir pen comprising a hollow pen barrel providing an ink reservoir, a hollow writing point section extending therefrom and having a rounded writing tip with a continuous surface and a plurality of slots extending lengthwise in its wall to a point short of the tip, a rigid ink regulator member having a series of parallel transverse grooves around its front end mounted within the point section to extend to the forward end of the ink reservoir, a narrow longitudinal groove extending from the rear end of the ink regulator member under the grooves and a second groove opposite to the narrow longitudinal groove extending from the rear end to a position just inside the point section to supply ink to the interior of the point section for flow therefrom outwardly through the slots to the writing tip.

6. An ink reservoir pen comprising a hollow pen barrel, a hollow writing point section extending therefrom and having a rounded writing tip with a continuous surface and a plurality of slots extending lengthwise in its wall to a point short of the tip, a rigid ink regulator member having a series of parallel transverse grooves around its front end mounted within the point section to extend to the forward end of the ink reservoir and so as to provide an air space at the rear end of and within the point section, a hole through the wall of the point section into the air space, a narrow longitudinal groove extending from the rear end of the ink regulator member under the grooves and a second groove opposite to the narrow longitudinal groove extending from the rear end to a position just inside the point section.

7. An ink reservoir pen comprising a hollow pen barrel, a hollow writing point member formed of two sections permanently secured together, and extending from the barrel, the writing point member having a narrow slot extending lengthwise in its wall and a rigid ink regulator member mounted within the point member to extend to the forward end of the ink reservoir.

8. An ink reservoir pen comprising a hollow pen barrel, a hollow writing point section extending therefrom and having a narrow slot extending lengthwise in its wall and a depression extending lengthwise in its wall, a rigid ink regulator member mounted within the point section in contact with the depression whereby said regulator member is held in place, said ink regulator extending to the forward end of the ink reservoir.

9. An ink reservoir pen comprising a hollow pen barrel providing an ink reservoir, a hollow writing point section extending therefrom and having a rounded writing tip with a continuous surface and a plurality of slots extending lengthwise in its wall to a point short of the tip, a rigid ink regulator member mounted within the point section to extend from the forward end of the ink reservoir and so as to provide an air space in the rear end of and within the point section, a hole through the wall of the point section into the air space, a narrow longitudinal groove extending from the rear end of the ink regulator member for supplying ink into the point section and a second longitudinal groove opposite to the narrow longitudinal groove extending from the rear end to a position just inside the point section adjacent the hole therein, for permitting air to flow into the barrel as ink flows therefrom.

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