April 23, 1935. R. B. KINGMAN 1,998,930

SOLUBLE INK FOUNTAIN PEN

Filed Oct. 16, 1934

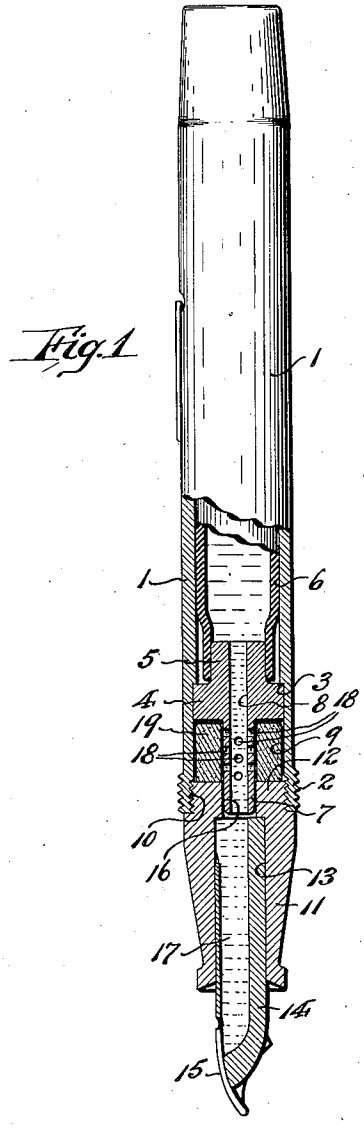

Fig. 1

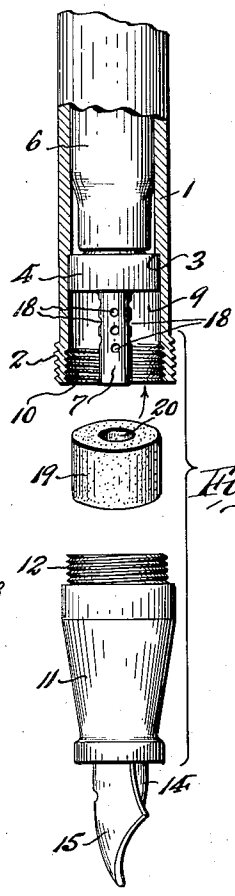

Fig. 2

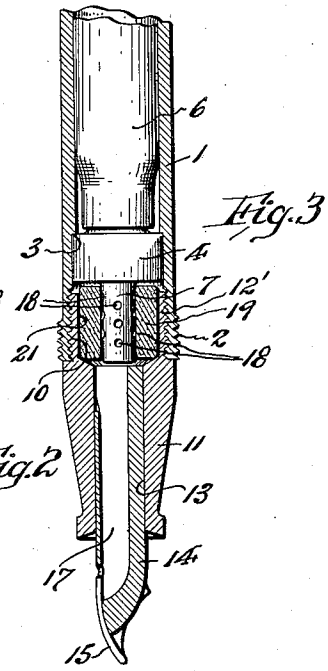

Fig. 3

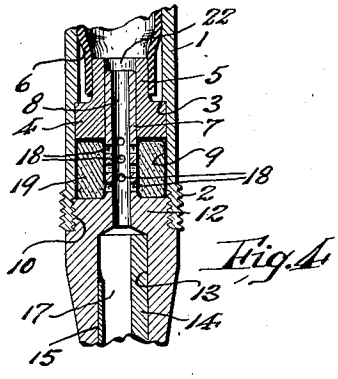

Fig. 4

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SOLUBLE INK FOUNTAIN PEN

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3 Claims. (Cl. 120—42)

This invention relates to improvements in the kind of fountain pens in which a writing fluid is formed by flowing water or other suitable solvent liquid in contact with comparatively dry but soluble ink material, the resultant writing fluid being delivered to the pen nib for writing operations therewith.

This invention has for its principal object to provide a very simple and inexpensive fountain pen of the kind above referred to which comprises a minimum number of parts so organized as to provide an easily accessible holding chamber for a cake of ink material, access to which, for refilling purposes, is attained by merely detaching the pen nib and feed carrying throat section of the pen; and the invention has for a further object to provide a novel arrangement of water or solvent liquid supply means for extension between a reservoir and the pen nib feed, such supply means having means of communication with the ink material holding chamber whereby the water or solvent liquid makes dissolving contact with the ink material to form the writing fluid desired for continued delivery through the pen nib feed to the pen nib.

Another object of this invention is to provide a novel construction and arrangement of ink material holding chamber and water or solvent supply means in such relation that the chamber surrounds the latter, whereby a solid ink material cake of novel annular perforate form may be inserted in the holding chamber so as to entirely surround the supply means and the means of communication between the latter and the chamber interior; the chamber thus formed and arranged being subject to endwise opening upon detachment of the pen nib and feed carrying throat section from the pen barrel or body, whereby refilling ink material cakes may be quickly inserted to replace such cakes after consumption in use.

Another object of this invention is to provide a novel construction and arrangement of ink material holding chamber adapted to be charged with a considerable mass of ink material capable of supplying the pen with writing fluid over a very long period of use; and a further object is to provide an annular perforate soluble ink cake as herein shown and described.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following detailed description of the same.

Illustrative embodiments of this invention are shown in the accompanying drawing, in which:—

Fig. 1 is a vertical longitudinal section through a pen according to this invention showing one form thereof, the conventional closing cap attachable to the barrel being omitted; and Fig. 2 is a fragmentary view in part section and in part elevation, showing the pen disassembled for refilling with an ink material cake.

Fig. 3 is a fragmentary longitudinal section, similar to that of Fig. 1 but showing a somewhat modified construction; and Fig. 4 is also a fragmentary longitudinal section showing another modified construction thereof.

Similar characters of reference are employed in the above described views, to indicate corresponding parts.

Referring to the drawing, the reference character 1 indicates the hollow main body or barrel of the pen, the same being externally screw threaded at its lower end, as at 2, for attaching thereto a removable cap (not shown) adapted to enclose the pen nib when the pen is not in use. Said body or barrel 1 is open at its lower end and closed at its upper end in the conventional manner. The lower open end portion of said body or barrel 1 is preferably internally counterbored to form within the interior thereof, and inwardly spaced from its open end, an annular shoulder 3. Inserted within the open lower end of the body or barrel and abutted against the shoulder 3 is a plug 4, the same being fixed in place by cement or by any other desired means of mechanical fastening. Integrally formed with said plug 4 to extend upwardly into the body or barrel interior is a neck 5 of reduced diameter, over which is engaged the open lower end of a resilient sac 6, which is thus contained within the interior of the body or barrel and which provides the water or solvent reservoir. Also integrally formed with said plug 4 to extend axially downwardly therefrom toward the open end of the body or barrel 1 is a conduit member 7, preferably of cylindrical conformation. Extending downwardly and centrally or axially through said neck 5, plug 4 and conduit member 7 is a duct or passage 8, which thus leads outwardly from the interior of said sac 6. By the arrangement of parts above described, there is formed at the lower end of the body or barrel 1, intermediate its open extremity and the plug 4, and surrounding said conduit member 7, an annular holding chamber 9 adapted to receive and hold a charge of soluble ink material in surrounding relation to said conduit member 7. The lower open end of the body or barrel 1 is internally screw-threaded, as at 10.

The reference character 11 indicates the removable throat section of the pen, the same having a butt portion 12 externally threaded to screw into the internally threaded portion 10 of the body or barrel 1, to thus detachably assemble said throat section in operative relation to the latter. In the form shown in Figs. 1 and 2 of the drawing, the throat section is provided with an axial bore 13 leading upwardly thereinto from its lower free end, and engaged in this bore 13 is a feed bar 14 and pen nib 15. Provided at the inner end of the throat section 11, to extend through the butt portion 12 to the bore 13 is an axial opening 16 sized to receive the end of the conduit member 7, when the throat section is attached to the body or barrel 1. The feed bar 14 is provided with a channel or duct 17 which communicates with the duct or passage 8 of said conduit member 7, and which extends therefrom to the back of the pen nib 15.

It will be observed that when the throat section 11 is operatively attached to and assembled with the body or barrel 1, the former closes the holding chamber 9 which is situated between said throat section and the plug 4. Provided in the walls of that portion of the conduit member 7 which extends through and is exposed to the interior of said holding chamber 9 are one or more lateral openings or ports 18 affording communication between the duct or passage 8 of the conduit member 7 and the interior of said holding chamber.

The reference character 19 indicates a cake of soluble ink material of cylindrical form having an axial opening 20 therethrough of a size adapted to receive the conduit member 7. To load the pen, the throat section is detached, thus exposing the end of the conduit member 7 through the open end of the body or barrel 1 which opens into the holding chamber 9, whereupon the ink material cake 19 is inserted into the holding chamber 9, so that the conduit member 7 is disposed through the central opening 20 of the cake, whereupon the throat section 11 is reassembled with the body or barrel 1, thus closing the ink material holding chamber so as to retain the ink material cake in surrounding relation to the perforate portion of said conduit member 7.

When the pen is thus charged with a supply of ink material, the sac 6 is supplied with water or other solvent by any suitable self-filling means such as is ordinarily provided in fountain pens. In operation, when the pen is disposed in writing position, water or other solvent flows from the reservoir or sac 6 into and through the duct or passage 8 of conduit member 7, and through the openings or ports 18 into the chamber 9 and thus in dissolving contact with the ink material contained in the latter, whereby a writing fluid is formed which flows through feed bar channel 17 to the pen nib 15 to issue from the latter during writing operations.

In Fig. 3 there is shown a slightly modified form of the novel pen structure, wherein the throat section 11 is provided with an elongated butt portion 12' threaded to engage the internally threaded walls of the chamber 9 of the pen body or barrel 1. Formed in said butt portion 12' is a socket 21 into which extends the conduit member 7 when the throat section is assembled with the pen body or barrel. The cake 19 of ink material may be deposited in the socket 21 preparatory to attaching the throat section to the pen body or barrel, thus affording an alternative method of loading the pen with the ink material supply.

In Fig. 4 another modified arrangement of the elements of the pen structure is shown, wherein the conduit member 7 is formed as an extension of the throat section 11 instead of an extension of the plug 4 as first described. In such arrangement, the plug 4 is provided with an axial bore 22 in which the upper free end of said conduit member 7 is telescopically received when the throat section is assembled with the pen body or barrel.

The functioning of the above described modified forms of the pen structure is the same as already set forth in connection with the first described form of the pen.

I am aware that various other changes could be made and many apparently widely different embodiments of this invention could be produced without departing from the scope thereof as defined in the claims appended hereto; consequently it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

I claim:—

1. In a fountain pen, a barrel interiorly arranged to provide a liquid reservoir means and a soluble ink material storage chamber, the latter chamber being accessible through the lower open end of said barrel, a throat section having a pen nib and a feed bar, said throat section being detachably engageable with the lower open end of said barrel in closing relation to said ink material storage chamber, and a conduit means axially disposed for extension through said latter chamber so as to communicate at its upper end with said liquid reservoir means and at its lower end with said feed bar when the throat section is assembled to the barrel, said conduit member having means of communication between its passage and the interior of said ink material storage chamber, and an axially perforate soluble ink body receivable in said latter chamber in surrounding relation to said conduit member.

2. For use in a fountain pen of the kind described, a soluble ink body having a centrally disposed longitudinal opening extending from end to end thereof.

3. In combination with a fountain pen of the kind described having an ink material storage chamber through which centrally extends a solvent conduit means leading from a source of solvent supply to the fountain pen nib and its feed means and which conduit means also has means of communication with the interior of said storage chamber, a soluble ink body having a centrally disposed opening extending from end to end thereof through which said conduit means may pass when said ink body is inserted in said storage chamber.

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