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SOLUBLE INK FOUNTAIN PEN

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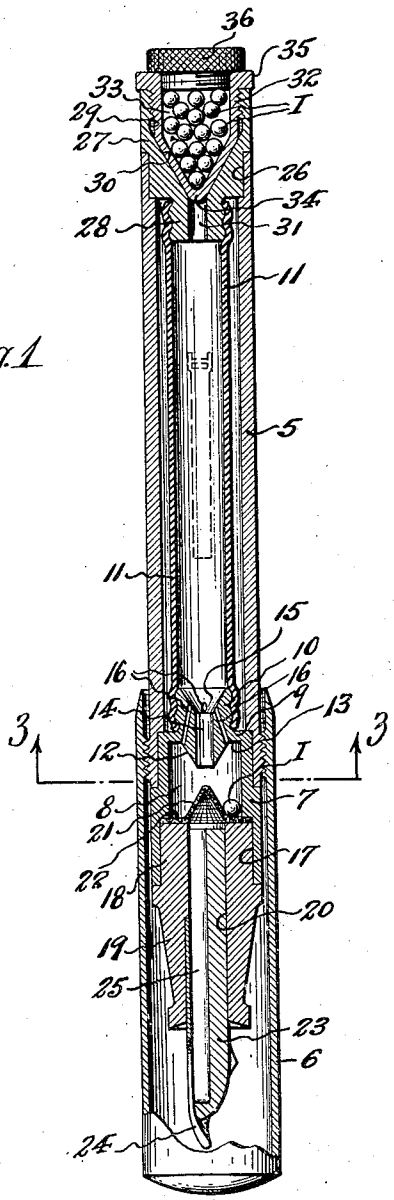

Fig. 1

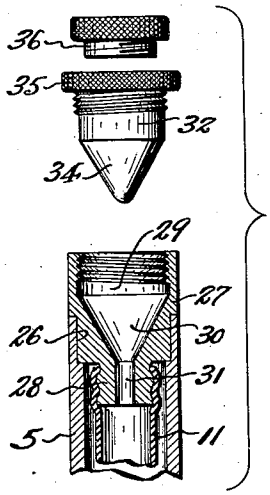

Fig. 2

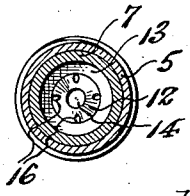

Fig. 3

Fig. 4

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SOLUBLE INK FOUNTAIN PEN

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4 Claims. (Cl. 120—42)

This invention relates to improvements in fountain pens utilizing pellets of initially dry but soluble ink to be dissolved in water so as to form and feed to the pen nib the resultant writing fluid.

This invention has for its principal object to provide, in a fountain pen of the kind described having a reservoir capable of being charged with a supply of water, means to carry a supply of soluble ink pellets, means to introduce said pellets as needed into the pen interior so as to dispose the same in the flow path of water gravitating from the reservoir to the pen nib, whereby the writing fluid is formed for delivery to the latter.

The invention has for a further object to provide a detachable means serving as a magazine to contain a liberal supply of soluble ink pellets sufficient to provide writing fluid over a very considerable period of time; said detachable means, when normally attached to the pen barrel serving additionally to close an opening or port through which the pellets may be introduced into the pen interior and in position to operatively combine with the water solvent with which the pen is charged.

The invention has for a further object to provide a novel means for trapping and holding an inserted pellet in the path of water flow to the pen nib; such means being so arranged that when the pen is not in use and is carried in the customary reversed position, the water is drained away from the inserted pellet so that its life is conserved.

Another object of the invention is to provide pellets having an initial soluble but stainless surface coating, whereby the same may be handled by the user's fingers without risk of staining the latter.

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

An illustrative embodiment of this invention is shown in the accompanying drawing, in which:—

Fig. 1 shows in vertical longitudinal section, a fountain pen according to this invention; Fig. 2 is a fragmentary view, in part vertical section and in part side elevation, to illustrate the separable relation of the ink pellet magazine to the pen barrel; Fig. 3 is a transverse section, taken on line 3—3 in Fig. 1, the detachable nib enclosing cap being omitted; and Fig. 4 is a sectional view of a soluble ink pellet, drawn on an enlarged scale.

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

In the drawing, the reference character 5 indicates the main body or barrel of the pen, the same being externally screw threaded, if desired, at its lower end to receive and hold the removable nib enclosing cap 6. Inserted in the lower end of the barrel 5, so as to be suitably coupled therewith, is a member 7 formed with a hollow interior adapted to provide a mixing chamber 8. Said member 7 is provided with a top wall 9 from which extends upwardly a neck-piece 10 to which is secured the lower end of a flexible tubular water sac 11 arranged to extend upwardly therefrom through the interior of the barrel 5. Depending from the underside of said wall 9, and longitudinally aligned with said neck-piece 10, is an inverted conical boss 12 adapted to define an annular upper seat 13 between the same and the side walls of said member 7. Extending through said neck-piece 10 and boss 12 is a central passage 14, the upper end of which is outwardly flared to provide a guide-funnel portion 15. Extending through said neck-piece 10, from the annular seat 13 into said guide-funnel portion 15 so as to communicate with the interior of said water sac 11 are one or more drain ducts 16. At its lower end, said member 7 is provided with a socket portion 17 of preferably somewhat enlarged diameter compared to that of the mixing chamber 8. Inserted into the socket portion 17, so as to be suitably coupled with the lower end of said member 7, is the stub 18 of a throat member 19. Said throat member is provided with an axial bore 20. Arranged at the lower end of said mixing chamber 8 and over the upper end of the throat member bore 20, is a conical perforate screen member 21, adapted to define an annular lower seat 22 between the same and the side walls of said member 7. Secured within and extending through the bore 20 of said throat member 19 is a feed bar 23, the lower end of which projects outwardly from the lower free end of said throat member and contiguous to a pen nib 24 secured in and also outwardly projecting from said throat member in the usual manner. Said feed bar 23 is provided with a feed channel 25 leading downwardly therethrough to terminate at the pen nib 24.

At its upper end, the barrel 5 is provided with a socket-portion 26. Inserted into the socket-portion 26 is an end-piece 27, provided at its inner portion with a neck-piece 28 to which is secured the upper end of said flexible tubular water sac 11. At its upper or outer end said end-piece 27 is provided with an internally screw-threaded cavity 29 with tapering bottom walls

defining a funnel-like mouth 30 converging downwardly upon an admission opening or passage 31, which extends through said neck-piece 28 into communication with the interior of said water-sac 11. Removably engageable in said cavity 29 of the end-piece 27 is an ink-holder or magazine 32 having an interior chamber 33 adapted to hold a supply of soluble ink pellets. The lower extremity of said ink-holder or magazine 32 is shaped to provide an inverted conical stopper portion 34 which conforms to and closely fits the funnel-like mouth 30. The ink-holder or magazine is externally threaded adjacent its upper end to engage the internal threads of said cavity 29, so that when the ink-holder or magazine is screwed downwardly into the latter, its conical stopper portion 34 will close and seal the admission opening or passage 31. At its outer extremity, said ink-holder or magazine is provided with an annular lateral flange 35 adapted to serve as a finger-piece for manipulation thereof when engaging or disengaging the same relative to the end-piece 27. The outer end of the magazine chamber 33 is normally closed by a detachable closure cap or member 36.

In the use of the pen, the ink-holder or magazine 32 is filled with a supply of ink pellets I. These ink pellets I comprise cakes of dye or ink material soluble in water. Preferably the pellets are coated with a thin outer covering or skin S of water soluble but stainless material, whereby the same may be handled by the user without risk of staining the fingers with the dye or ink material. In use, the outer covering or skin S quickly dissolves on contact with water whereby the dye per se may be in turn dissolved to provide the ink solution.

To charge the pen for use, the water sac 11 is filled with water, either by any well known sac squeezing or other filler attachments, or by removing the ink-holder 32 and introducing water through the admission opening or passage 31 of the end-piece 27. When the latter method is used, the flexible water sac 11 may be omitted, and the interior of the barrel itself used as the water reservoir if desired. Water having been supplied to the water sac 11, the ink-holder 32 is opening by removal of its closure cap 36, and an ink-pellet I is taken therefrom. With the ink holder or magazine removed from the end-piece 27, the pellet I is dropped into the cavity 29 of the latter, where it is guided by the funnel-like mouth 30 to descend through the admission 31 into the water sac interior. The pellet, thus introduced, gravitates through the water until it reaches the bottom end of said water sac, whereupon it enters the guide funnel portion 15 to be guided thereby to and through the passage 14 into the mixing chamber 8 lodging in the lower annular seat 22 of the latter, as shown in Fig. 1. The ink holder or magazine is now screwed into the cavity 29 of the end-piece 27, so that the conical stopper portion 34 will engage in the funnel-like mouth 30 so as to snugly and tightly fit the same and close the admission passage 31 against escape of water therethrough. The pen is now ready for use.

When the pen is pointed nib down or in writing position, water from the water sac 11 will descend through the passage 14 into the mixing chamber 8 so as to therein come in dissolving contact with the ink pellet I lodged within the latter. As a result of such contact a suitable writing fluid is formed, which passes through the perforate screen member 21 and flows downwardly through the feed channel 25 of the feed bar 23, to serve the pen nib 24 during writing operations therewith.

When writing use of the pen is discontinued, and the pen is closed by the cap 6 and reversed in position, i. e. with pen nib upward, in which position fountain pens are ordinarily carried when not in use, the undissolved portion of the ink pellet will drop to the upper seat 13 of the mixing chamber 8, and the ink solution will drain from the feed bar channel into the mixing chamber and thence through the drain ducts 16 back into the water sac 11, leaving the pellet in the mixing chamber free from water contact, so that it is conserved for further use, when the pen is again brought into writing position.

From the above description, it will be understood that the present invention provides a very serviceable soluble ink pen, in connection with which a generous supply of dry ink pellets can be conveniently carried as reserve, and when renewal of ink pellet charges are desired to be made for replenishing the writing fluid requirements of the pen, it is an exceedingly simple and easy matter to remove an ink pellet from the ink holder and thereupon insert the same through the admission passage at the pen top for delivery into the mixing chamber 8 ready for use. This recharging operation can be accomplished quickly and with no necessity for handling mussy or ink stained or daubed parts, and consequently a clean and convenient pen is assured.

I am aware that many changes could be made in the above described constructions, and many apparently widely different embodiments of this invention could be produced without departing from the scope of the invention as defined in the following claims. It is therefore intended that all matter contained in the foregoing description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

I claim:—

1. In a soluble ink fountain pen, a solvent reservoir, a feed means to deliver writing fluid to the pen nib, means intermediate said feed means and said solvent reservoir adapted to provide a mixing chamber, ink-pellet admission means communicating with the upper end of said solvent reservoir through which an ink-pellet may be passed to descend through said reservoir and into said mixing chamber, means to normally close said admission means, said mixing chamber having means to trap a pellet entered therein against escape therefrom.

2. In a soluble ink fountain pen, a barrel, means to provide a mixing chamber at the lower end of said barrel, a throat member to hold a pen nib connected below said mixing chamber, a channeled feed bar in said throat member adapted to deliver writing fluid to the pen nib from said mixing chamber, means providing an intake opening at the upper end of said barrel, a solvent reservoir between said mixing chamber and intake opening means, said intake opening being adapted to admit an ink pellet for descent through said reservoir into said mixing chamber, means to close said intake opening, and said mixing chamber having means to trap a pellet entered therein against escape therefrom.

3. In a soluble ink fountain pen, a barrel, means to provide a mixing chamber at the lower end of said barrel, a throat member to hold a pen nib connected below said mixing chamber, a channeled feed bar in said throat member adapted to

deliver writing fluid to the pen nib from said mixing chamber, means providing an intake opening at the upper end of said barrel, a solvent reservoir between said mixing chamber and intake opening means, said intake opening being adapted to admit an ink pellet for descent through said reservoir into said mixing chamber, means to close and seal said intake opening, and said mixing chamber having means to trap a pellet entered therein against escape therefrom, said mixing chamber means having drain ducts operative when the pen is reversed from writing position to drain solvent out of said mixing chamber back into said reservoir.

4. In a fountain pen of the kind described, a pen barrel having a solvent reservoir, a hollow end-piece secured to the upper end of said barrel, said end-piece having a funnel-like bottom terminating in a passage communicating with the solvent reservoir, a closure means detachably connected with said end-piece and having a conical inner end portion to fit said funnel-like bottom of the latter to close and seal said passage.

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