

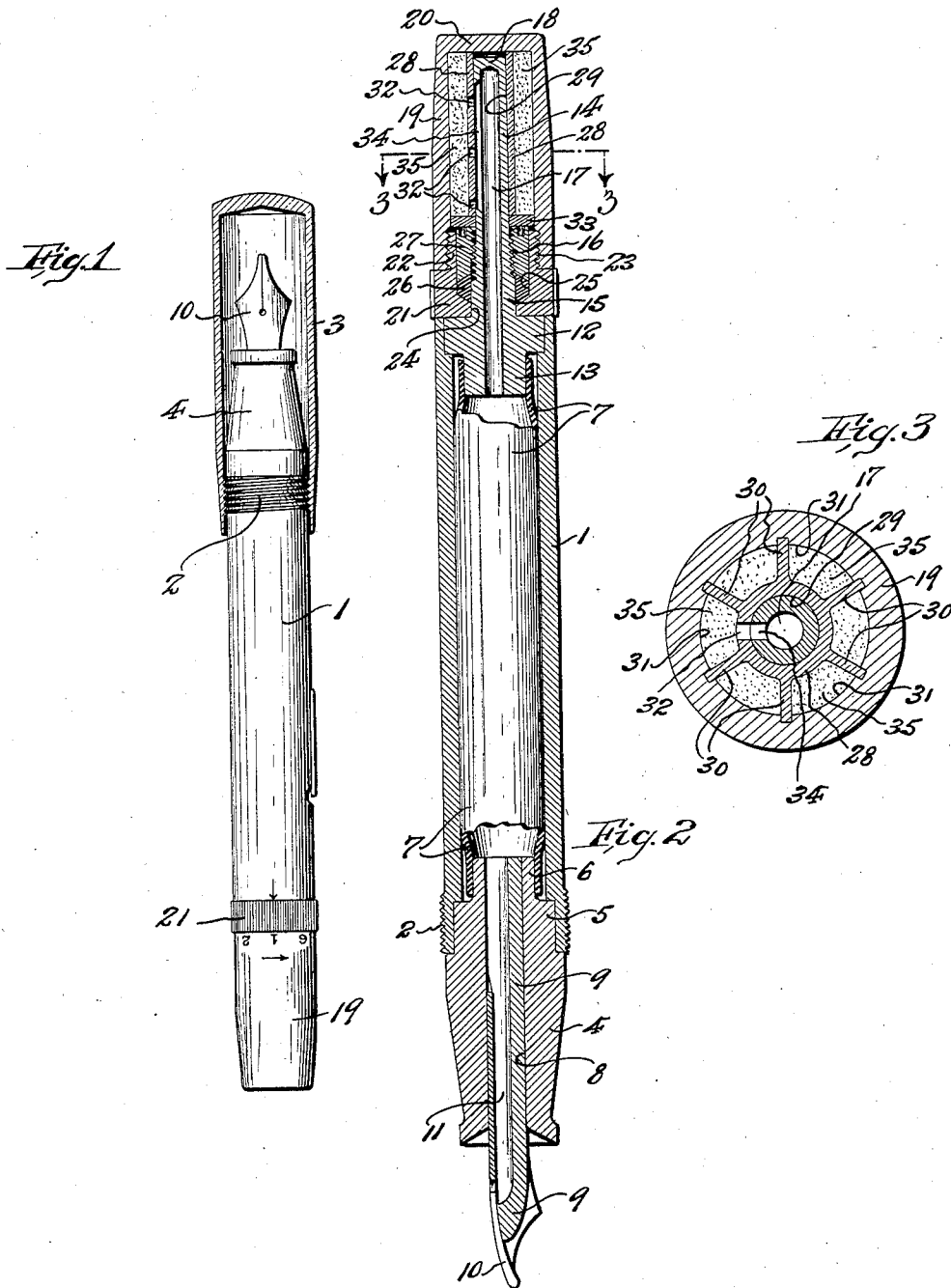
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SOLUBLE INK FOUNTAIN PEN

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SOLUBLE INK FOUNTAIN PEN

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3 Claims. (Cl. 120—42)

This invention relates to improvements in the type of fountain pens in which the writing fluid is formed by bringing water or other suitable solvent liquid, with a quantity of which the interior of the pen is supplied, in contact with a mass of comparatively dry but soluble ink material, whereby the water or the like is converted, within the pen interior, into a writing fluid which is served to the pen nib during writing operations therewith. This invention has reference, more particularly, to certain improvements in fountain pens of the described type and of the general kind described in my prior United States Letters Patent No. 1,912,774 dated June 6th, 1933, wherein a plurality of individual ink masses are arranged to be successively available for contact by the water or solvent in the production of the desired writing fluid.

The instant invention has for its principal object to provide a novel fountain pen of the type above mentioned, which is so constructed and arranged that the water or solvent is brought into contact with the relatively dry and soluble ink material only when the pen is disposed in the inverted position in which it is ordinarily carried when not in use, that is with the pen nib up-pointed, or when the pen is in horizontal position, as, e. g. when carried in a woman's handbag. By such arrangement, due to the fact that fountain pens usually occupy such inverted or horizontal inactive or idle positions for comparatively considerably longer intervals of time than the intervals of time wherein they are disposed in writing position, the water or solvent is maintained in dissolving contact with the ink material for relatively long periods of time, so that the water or solvent may, by such relatively long time period of contact, be thoroughly charged with the dissolved ink material, even to the saturation point, and consequently there is formed a volume of writing fluid, of uniform density and color, which is immediately available to be served to the pen nib, when the pen is turned and erected to its normal writing position.

Another object of this invention is to provide a fountain pen having a water reservoir or compartment communicating at its lower end with the pen nib and its feed, and at its opposite end with a conduit means subject to communication with the comparatively dry or solid ink material (said water reservoir or compartment being subject to the usual refilling operations), in combination with an ink material magazine rotatably related to said conduit means, and provided with a plurality of individually segregated masses of ink

material adapted, by rotation of said magazine, to be selectively or successively brought into communication with said conduit means and thereby exposed to contact with the water from said reservoir.

Other objects of this invention, not at this time more particularly enumerated, will become apparent in the following detailed description of the same.

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

Fig. 1 is an elevational view of a soluble ink fountain pen according to this invention, the same being shown in its inactive or idle position as distinguished from its writing position, and with the removable cap (shown in section) attached in pen nib enclosing position; Fig. 2 is a longitudinal section through the pen, with the cap removed, and the pen shown in its active or erect writing position, this view being drawn on an enlarged scale; and Fig. 3 is a horizontal section, taken on line 3—3 in Fig. 2, and drawn on a further enlarged scale.

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 main body or barrel of the pen, the same being externally screw-threaded, as at 2, adjacent to its lower end, for the securing of the removable cap 3, which is adapted to enclose the pen nib when the pen is not in use. The reference character 4 indicates the throat section of the pen, the same having a butt portion 5 at its inner end which is inserted into the lower open end of the barrel 1 to operatively connect the same thereto. Extending from the inner end of said butt portion 5 is a spud 6 of reduced diameter, over which is engaged the lower end of a flexible rubber sac 7 which is adapted to serve as a reservoir or container for water or other suitable solvent with which the pen is to be charged preparatory to its use. Said throat section 4 is provided with the usual axial bore 8, which extends therethrough, and through said butt portion 5 and spud 6, and in which is engaged and held a feed bar 9 and pen nib 10 in the usual manner. Said feed bar 9 is provided with a channel or duct 11 which communicates with the interior of the sac 7, and which extends therefrom to the back of the pen nib 10.

The upper end of the barrel or main body 1 is closed by a plug 12 which is inserted therein and preferably suitably secured thereto by cement

or by any desired means of mechanical fastening. Extending downwardly from the under or inner side of said plug 12 into the interior of said barrel or main body 1 is a spud 13 of reduced diameter, over which is engaged the upper end of said sac 7. Extending upwardly from the upper or outer side of said plug 12 is an axial conduit member 14 of circular cross section, and provided adjacent to said plug with an annularly enlarged section 15, a portion of which is externally threaded, as at 16. Extending through said spud 13, plug 12 and into said conduit member 14 is an axial duct or passage 17, which is thus arranged in communication with the interior of the sac 7 which provides the water or solvent reservoir. Preferably said spud 13, plug 12 and conduit member 14 constitute an integral structure, and the free end of said conduit member 14 is preferably closed by an end wall 18.

Arranged in connection with the upper end of said main body or barrel 1, so as to be mounted concentric to said conduit member 14—15 in rotatable relation thereto, is a hollow ink material magazine, the same comprising an external shell 19 closed at its top or free end by an end wall 20. At its lower or inner end, said shell 19 is provided with a coupling member 21 having a shank 22 of reduced diameter for insertion into the lower end of said shell 19 in suitably affixed relation thereto, as e. g. by the screw threads 23 or other suitable fastening means. Said coupling member 21 is preferably of a diameter slightly in excess of the diameter of the main body or barrel 1, and its circumferential surface is suitably knurled or roughened, whereby the coupling member 21 may also serve as a finger piece in the manipulation of the ink material magazine to accomplish its rotation relative to the conduit member 14—15. The bottom end of said coupling member 21 is provided with a central opening 24 sized to pass the conduit member 14 and to receive and fit the enlarged section 15 of the same. Above said opening 24 is a diametrically enlarged stuffing box chamber 25 to receive a suitable packing material 26 which is held in leak-proof relation to and around said enlarged section 15 of the conduit member 14 by a gland member 27 which is threaded upon the screw threads 16 of said conduit member section 15. Extending centrally through said shell 19 to the end wall 18 thereof is a hub sleeve 28 having an axial bore 29 to receive and fit the conduit member 14. Extending longitudinally along said hub sleeve 28, as integral parts thereof and in circumferentially spaced radial projection therefrom, are a plurality of partition members 30, the free margins of which abut the wall of said shell 19, preferably in slightly countersunk relation thereto, thus dividing the interior of the shell 19 into a plurality of ink material storage chambers or compartments 31 radial to said hub sleeve 28. Formed in the wall of said hub sleeve 28, to provide communication means with the respective chambers or compartments 31 are one or more openings 32, which may be of any desired shape or arrangement. Said chambers or compartments 31 are open at their lower ends, such open ends being closed by a closure washer or disc 33, thus segregating the different chambers or compartments one from another. Formed in the wall of said conduit member 14 is a port 34, with which the communication openings 32 of the several chambers or compartments may be selectively brought into registration or alignment so as to dispose

any desired chamber or compartment in communication with the duct or passage 17 of said conduit member 14—15.

It will be understood that the ink material magazine is rotatably related to the conduit member 14—15, and is frictionally held thereto against accidental displacement therefrom due to the stuffing box connection of the coupling member, which also serves to prevent leakage of solvent to the exterior of the pen. It will be also apparent that the ink material magazine may be removed from the conduit member, when the supply of ink material 35 carried in the several chambers or compartments thereof is exhausted, so that such magazine may be either recharged with ink material, or a new charged magazine substituted therefor for replacement upon and in operative relation to the pen.

When the ink material magazine is operatively assembled with the pen, and the sac 7 is supplied with water or other solvent by any suitable self-filling means such as ordinarily provided in fountain pens, the magazine may be turned upon the conduit member 14—15 to bring a desired ink material containing chamber or compartment into communication with the passage or duct 17 of said conduit member. In order to assist the user in readily and quickly ascertaining the operative position of the magazine relative to the conduit member for bringing a selected ink material chamber or compartment into operative relation to said conduit member, the outer surface of the magazine may be provided with positioning marks or indicia corresponding in number and circumferential spacing to the number and spacing of the magazine ink material chamber or compartments, which marks or indicia can be selectively opposed or registered, by turning the magazine, relative to a fixed register or positioning mark carried by the pen barrel 1, to indicate the operative aligning position of the conduit member port 34 with the communication means 32 of the selected chamber or compartment which is desired to be brought into operative relation to the water or solvent reservoir (see Fig. 1).

In the operation of the pen, after a given ink material chamber or compartment of the magazine is operatively related to the port 34 and passage or duct 17 of the conduit member, and the pen is inverted or turned from its normal writing position, as e. g. to occupy the position shown in Fig. 1 in which it is ordinarily carried in the user's pocket, the water or solvent from the sac 7, or other form of reservoir, will flow by gravity into the passage or duct 17 of the conduit member 14—15, and will be brought into contact, through the registered port 34 and communication openings 32, with the ink material content of the communicating chamber or compartment of the magazine. Owing to the active and rapid solubility of the ink material, as composed for service in the instant form of pen according to this invention, such contact of the water or solvent therewith will dissolve an amount of such ink material sufficient to thoroughly impregnate the water or solvent and thereby convert the same into an efficient writing fluid. With a properly composed ink material, no more thereof will be taken up by the water or solvent than is sufficient to saturate the latter, and consequently the derived writing fluid is used until consumed, whereupon by refilling the reservoir with water or solvent a renewed supply of such fluid is obtainable. Owing to the fact that fountain pens are usually carried in the described inactive or non-

service positions for considerable long intervals of time between the periods of use thereof for writing operations, a sufficient time is provided, during such comparatively long intervals of non-use, to assure effective dissolution of the ink material and its combination with the water or solvent in the production of the desired writing fluid of adequate density and color.

It will be obvious that after the ink material is exhausted from one chamber or compartment of the magazine, the latter may be turned to register another compartment or chamber thereof in communication with the water or solvent reservoir through the conduit member, and so on until the entire supply of ink material has been exhausted and the magazine is empty. The empty magazine may be removed from the pen and recharged with ink material, or replaced with a new filled magazine, the magazine being of such form and so arranged as to be readily capable of being manufactured and independently sold as a refill or replacement element of the pen.

It will be understood that the water or solvent reservoir and the filling means therefor, as well as the pen nib and feed bar means serving the latter, may be variously made either in present known or conventional forms and arrangements, or in specially designed forms if desired.

Having described my invention, I claim:—

1. In a fountain pen of the kind described, a barrel provided with a throat section at one end to carry a pen nib and a feed bar therefor, said barrel being arranged to provide a liquid reservoir communicating at its lower end with said feed bar, a conduit member extending axially from the opposite end of said barrel, said conduit member having a passage communicating with the upper end of said liquid reservoir, a coupling member rotatably mounted on said conduit member, said coupling member having a stuffing-box chamber about said conduit member, a gland member, packing material retained in said stuffing-box chamber by said gland member, and soluble ink holding means carried by said coupling member, said conduit member having a port leading from its passage to said holding means, whereby the liquid content of said reservoir is brought into dissolving contact with said soluble ink content of said holding means when the pen is disposed in inactive or non-writing position.

2. In a fountain pen of the kind described, a barrel provided with a throat section at one end to carry a pen nib and feed bar therefor, said barrel being arranged to provide a liquid reservoir communicating at its lower end with said feed bar, a conduit member extending axially

from the closed upper end of said barrel, said conduit member having an axial passage communicating with the upper end of said liquid reservoir, a coupling member rotatable on and about said conduit member adjacent to the upper end of said barrel, said coupling member having a stuffing-box concentric to said conduit member, a gland member threaded on a portion of said conduit member, packing material retained in said stuffing-box chamber by said gland member, a holding means affixed to said coupling member to rotate therewith about said conduit member, said holding means being adapted to contain a plurality of segregated ink material masses, and means operative upon rotation of said holding means to various adjusted positions for selectively bringing said ink material masses in communication with said conduit member passage, whereby the liquid content of said reservoir is brought into dissolving contact with the exposed ink material mass when the pen is disposed in inactive or non-writing position.

3. In a fountain pen of the kind described, a barrel provided with a throat section at one end to carry a pen nib and feed bar therefor, said barrel being arranged to provide a liquid reservoir communicating at its lower end with said feed bar, a conduit member extending axially from the closed upper end of said barrel, said conduit member having an axial passage communicating with the upper end of said liquid reservoir, a coupling member rotatable on and about said conduit member adjacent to the upper end of said barrel, said coupling member having a stuffing-box concentric to said conduit member, a gland member threaded on a portion of said conduit member, packing material retained in said stuffing-box chamber by said gland member, an ink material magazine affixed to said coupling member to rotate therewith about said conduit member, said magazine having an axial hub sleeve to receive and turn on said conduit member, radial partition members extending from said hub sleeve to the walls of said magazine to form a plurality of ink material storage chambers, said hub sleeve having means of communication between said storage chambers and the bore of said hub sleeve, and said conduit member having a port leading from its passage with which said communication means may be selectively registered by rotation of said magazine, whereby the liquid content of said reservoir is brought into dissolving contact with ink material in a given storage chamber when the pen is disposed in inactive or non-writing position.

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