Feb. 21, 1933. F. C. McGAUGHY 1,898,844

FOUNTAIN PEN

Filed April 15, 1932

FIG. 1.

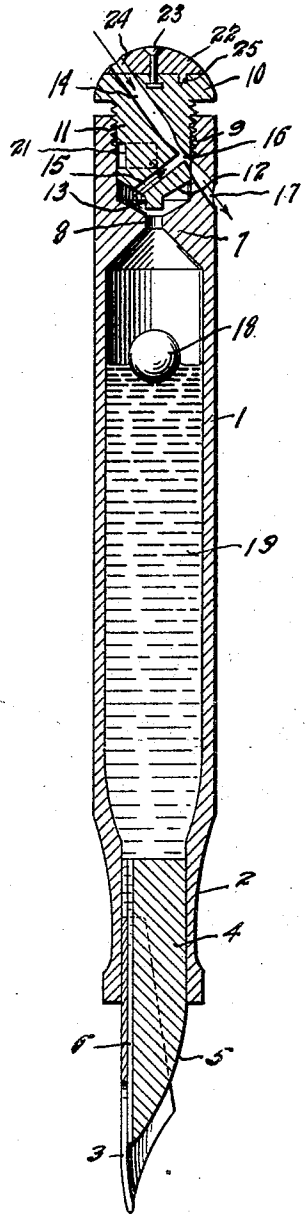


FIG. 2.

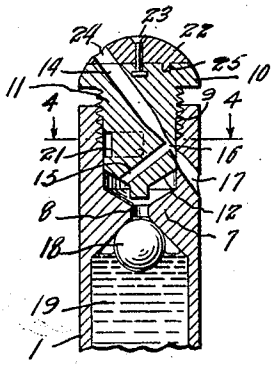


FIG. 3.

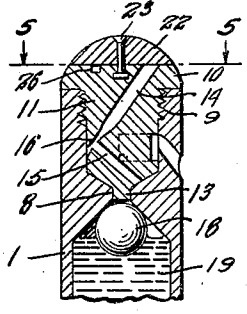


FIG. 4.

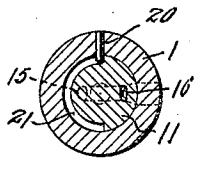
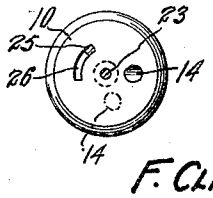


FIG. 5.



Inventor

F. CLAY McGAUGHY

By Semmes & Semmes

Attorneys

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UNITED STATES PATENT OFFICE

FRANKLIN CLAY McGAUGHY, OF TUPELO, MISSISSIPPI

FOUNTAIN PEN

Application filed April 15, 1932. Serial No. 605,533.

This invention relates in general to fountain pens and more particularly has reference to a fountain pen for filling with ink by the creation of a vacuum therein.

Previous to this time, while various types of fountain pens have been provided for filling with ink by the creation of a vacuum therein, such have included certain fundamental disadvantages which this invention overcomes. Practically all types of fountain pens have included a rubber tube for containing the ink, which naturally deteriorates in use. Also, in the types of pen where a portion of the barrel has been adapted to serve as a reservoir for the ink, only a small quantity has been provided for, as the operating mechanism has taken up a major portion of the barrel and in addition complicated the assembly of the pen.

An object of this invention is to provide a fountain pen in which substantially the entire barrel is adapted to serve as an ink reservoir.

Another object of this invention is to provide a fountain pen adapted to be filled with ink by a vacuum created through a person exhaling air in the pen.

Still another object of this invention is to provide a fountain pen adapted to be filled with ink by creation of a vacuum therein and having no moving parts for effectively filling.

A further object of this invention is to provide a fountain pen having an aperture in one end through which a vacuum is adapted to be created for the filling of the pen, which is normally positively closed.

A still further object of this invention is to provide a fountain pen adapted to be filled with ink by the creation of a vacuum in which there are no moving parts operated in the filling operation.

With these and other objects in view, which may be incident to my improvements, the invention consists in the parts and combinations to be hereinafter set forth and claimed, with the understanding that the several necessary elements comprising my invention may be varied in construction, proportions and arrangement without departing from the spirit and scope of the appended claims.

In order to make my invention more clearly understood, I have shown in the accompanying drawing, means for carrying the same into practical effect without limiting the improvements in their useful applications to the particular constructions, which, for the purpose of explanation have been made the subject of illustration.

In the drawing forming a part of my specification:—

Figure 1 is a side sectional view of the pen while being filled.

Figure 2 is a side sectional view of the top of the pen shown filled.

Figure 3 is a side sectional view of the top of the pen shown after filling.

Figure 4 is a sectional view taken on line 4—4 of Figure 2.

Figure 5 is a top view taken on line 5—5 of Figure 3.

Referring more particularly by numerals to the drawing and especially to Figure 1, it will be seen that this is a pen comprising a barrel 1, composed of any suitable material, such as hard rubber or a phenol condensation product, reduced at the lower end, as at 2, for facilitating grasping by the fingers in writing. A pen point 3, of any suitable character, is inserted in the aperture provided in the lower reduced end of the barrel, adapted to be held therein by a closure 4 tapered as at 5 on the under side of the pen point and having a channel 6 provided in the top thereof for admitting ink from within the barrel 1 to the tip of the pen point. The closure 4 and pen point 3 are adapted in conjunction to close the barrel to prevent the leakage of ink therefrom, except that flowing in the channel 6 provided in the closure for writing purposes.

A conventional top portion or cover, not shown, may be fitted over the reduced end of the barrel in the usual manner.

The inner periphery of the barrel 1 is constricted as at 7 adjacent the top end of the barrel to provide an aperture 8, and the end of the barrel is internally threaded as at 9.

The top end of the barrel 1 is adapted to be closed by a block 10 having an integral externally threaded plug 11 formed on the

bottom thereof for screwing in the end of the barrel. The end of the plug 11 is reduced, as at 12, and terminated in a stopper 13 for extending in the aperture 8 and restricted peripheral portion 7 of the barrel, to positively close the top end of the ink reservoir when the plug 11 is fully screwed in the top of the barrel.

A diagonal aperture 14 is provided in the block 10 and plug 11, opening in the face of the block and in the periphery of the plug adjacent the lower end, and communicating with an opposite diagonal aperture 15 provided in the lower portion of the plug 11 and opening on the lower reduced periphery 12 thereof. The aperture 14 is constricted at the point where it coincides with the aperture 15, as indicated at 16, to provide a Venturi arrangement, the apertures 14 and 15 acting as an aspirating pump with the passage of a current of air through passage 14. The opening of the aperture 14 on the periphery of the plug 11 is adapted to be registered with a diagonal aperture 17 provided in the wall of the barrel 1 adjacent the top end by turning of the plug 11 with respect to the barrel.

A float 18 is adapted to be accommodated in the ink reservoir provided in the barrel.

For filling the pen, the pen point and tapered end of the closure are adapted to be inserted in a quantity of ink and the pen filled by creating a vacuum in the reservoir. The vacuum is created by unscrewing the plug 11 with respect to the barrel so as to withdraw the projection 13 from the aperture 8 to open communication between the reservoir and the aperture 15 in the lower portion of the plug. By directing a current of air through the aperture 14 a vacuum is created in the barrel so as to draw ink through the groove 6 in the plug 5 into the reservoir. This, as has already been indicated, is preferably accomplished by exhaling or blowing through the aperture 14. If it should be desired, a suction may be created by closing the aperture 17 in the wall of the barrel and sucking through the aperture 14, although the blowing process to create the vacuum by an aspirating action is deemed preferable.

When the ink reservoir is completely filled, the float 18 will close the aperture 8, as shown in Figure 2, so that no ink will inadvertently be drawn through the aperture 8 into the top portion of the barrel.

Relative longitudinal movement between the plug 11 and the barrel 1 is adapted to be limited by a pin 20 fixed in the wall of the barrel, as shown in Figure 4, for engaging in a groove 21 provided around a portion of the periphery of the plug 11. In the construction shown the plug 11 is adapted to be screwed a half-turn with respect to the barrel for withdrawing and inserting the projection 13 formed thereon in the aperture 8 and bringing the aperture 14 into register with the aperture 17 in the wall of the barrel.

I preferably provide a top piece 22 on the top of the block 10 to conform therewith, pivoted to a pin 23. An aperture 24 is provided in the top 22 for registering with the top opening of the aperture 14 in the block 10. I also provide a projection 25 on the underside of the top 22 for fitting in a groove 26 provided on the top of the block to limit movement of the top piece 22 with respect to the block.

When the pen is in normal use, the relative position of the elements is that shown in Figure 3, the top opening of the aperture 14 being closed by the top piece 22 and the lower opening of the aperture 14 being closed by the inner periphery of the top portion of the barrel 1. The lower opening of the aperture 15 is also closed by the peripheral constricted portion of the barrel 1 and the aperture 8 in the constricted portion is closed by block 13 fitting therein. When it is desired to fill the pen, the top piece 22 is rotated about the pin 23 for registration of the aperture 24 with the top opening of the aperture 14 in the block, movement of the top piece being limited by projection 25 operating in groove 26. The block 10 is also rotated to bring the lower opening of the aperture 14 in registration with the aperture 17 in the barrel wall and to withdraw the projection 13 from the aperture 8. Relative longitudinal movement between the plug and the barrel in unscrewing and screwing is limited by the pin 20 in the wall of the barrel engaging in the groove in wall 21 provided on the plug. In the operative position as shown in Figure 1, by exhaling or blowing through aperture 24, a vacuum is created in the ink reservoir so as to draw ink therein through the channel 6 provided in the plug 5 when the pen point is submerged in the quantity of ink.

The float 18 will prevent ink being drawn into the top portion of the barrel through the aperture 8 and the aperture provided in the plug, the block and the top 22, or through the aperture 17 in the wall of the barrel by closing the aperture 8 as shown in Figure 2. After the pen has been filled the plug 11 is screwed in the barrel so that the aperture 8 is closed by the projection 13 and the lower openings of the apertures 14 and 15 closed by the peripheral wall of the barrel 1 and the top piece 22 rotated with respect to the block to close the top opening of the aperture 14.

There is accomplished by this invention a fountain pen having substantially the entire barrel adapted to serve as an ink reservoir for filling by creation of a vacuum therein, in which there are no moving parts for actuation in the filling operation, and no rubber elements subject to deterioration.

While I have shown and described the preferred embodiment of my invention, I wish it

to be understood that I do not confine myself to the precise details of construction herein set forth by way of illustration, as it is apparent that many changes and variations may be made therein by those skilled in the art without departing from the spirit of the invention, or exceeding the scope of the appended claims.

I claim:

1. A fountain pen comprising a barrel, an ink reservoir formed by the major portion of the barrel and having an aperture therein and a plug having diagonal communicating apertures therein forming an aspirating pump, one of the aperture openings being adapted to register with an aperture in the wall of the barrel, mounted in the barrel and communicating with the reservoir aperture.

2. A fountain pen comprising a barrel, an ink reservoir formed by the major portion of the barrel and having an aperture therein and a screw plug carrying a projection for selectively closing the reservoir aperture and having diagonal apertures therein forming an aspirating pump, one of the aperture openings being adapted to register with an aperture in the wall of the barrel, mounted in the barrel in communication with the reservoir aperture.

3. A fountain pen comprising a barrel, an ink reservoir formed by the major portion of the barrel and having an aperture therein, a screw plug limited in movement formed with a projection for selectively closing the reservoir aperture, and having diagonal apertures, one a constricted aperture forming an aspirating pump, one opening of the constricted aperture being adapted to register with an aperture in the wall of the barrel and the other to be selectively closed by a top mounted for limited rotation on the top of the plug and having an aperture for selectively registering with the top opening of the constricted aperture in the plug, mounted in the barrel in communication with the reservoir aperture, and a float in the reservoir for closing the aperture therein when the reservoir is filled.

4. A fountain pen comprising a barrel, an ink reservoir therein, the barrel having provided therein intersecting apertures communicating with the ink reservoir for drawing ink therein through an aspirating action, and means to normally close the apertures.

5. A fountain pen comprising a barrel, an ink reservoir therein, and a pair of intersecting apertures provided in the barrel for drawing ink in the reservoir through an aspirating action, and means for normally closing the apertures in the exterior of the barrel.

6. A fountain pen comprising a barrel, an ink reservoir therein, and a plug having a pair of intersecting apertures communicating with the ink reservoir and adapted to selectively register with apertures in the barrel for filling the ink reservoir through an aspirating action.

7. A fountain pen comprising a barrel, an ink reservoir formed in the barrel, and a plug having intersecting communicating apertures therein forming an aspirating pump, one of the apertures adapted to communicate with the reservoir and the barrel and one of the apertures being adapted to selectively register with an aperture in the wall of the barrel.

In testimony whereof I affix my signature.

FRANKLIN CLAY McGAUGHY.