No. 802,668. PATENTED OCT. 24, 1905.

H. TAYLOR.

FOUNTAIN PEN.

APPLICATION FILED OCT. 22, 1904.

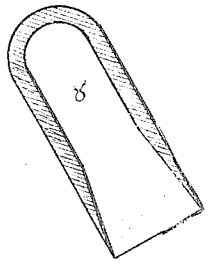


Fig. 3.

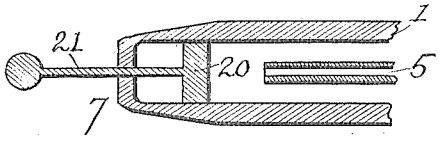
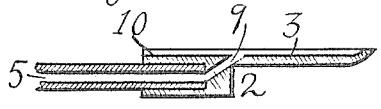


Fig. 1.

Fig. 2.



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UNITED STATES PATENT OFFICE.

HUSTON TAYLOR, OF WATERVILLE, NEW YORK, ASSIGNOR TO AIKIN, LAMBERT & COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

FOUNTAIN-PEN.

No. 802,668. Specification of Letters Patent. Patented Oct. 24, 1905.

Application filed October 22, 1904. Serial No. 229,600.

To all whom it may concern:

Be it known that I, HUSTON TAYLOR, a citizen of the United States, residing at Waterville, in the county of Oneida and State of New York, have invented a new and useful Improvement in Fountain-Pens, of which the following is a specification.

My invention relates to fountain-pens of the so-called "self-filling" type, and the objects are to provide a filling device that is durable, efficient in operation, and simple in construction whereby the reservoir may be charged with ink by means of atmospheric pressure. I attain these objects in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal cross-sectional view of the complete fountain-pen; Fig. 2, a cross-sectional view showing a modification of the feed-duct and air-tube, and Fig. 3 a cross-sectional view showing the air-pump in the form of a piston.

The fountain-pen is composed of the usual barrel or ink-reservoir 1, having the ink-feeding device 2, (provided with the ink-port 3.) The usual pen 4 is secured in the barrel adjacent to the ink-feed. These may be of any suitable or desired type. The air-tube 5 is in communication with the ink-feed 2 and extends the entire length of the barrel and into the air-chamber 6, formed by the pumping device 7, secured to the barrel 1 and protected by the cap 8.

I do not limit myself to the use of the bulb-syringe shown in Fig. 1, as a piston 20, secured in the barrel and operated by the rod 21, is an obvious equivalent therefor.

A port 9 is made in the air-tube 5 and communicates with the feed-port 3, or, as shown in Fig. 1, is immediately adjacent to the ink-outlet of the barrel. This latter outlet 10 is the one through which the ink flows to the feed-port 3, and thence to the pen 4, and is of such size that the friction of the ink against its walls will resist the flow of ink when pressure is applied by means of the air-pump, thus allowing the air in the barrel above the ink to pass out through the tube 5, port 9, and port 3 without expelling the ink in the lower part of the barrel, which normally feeds through the opening 10 into the feed-port 3. In other words, the air is expelled before the pressure on the ink has overcome the frictional resistance offered by the port or opening 10.

The operation of the device is as follows: The fountain-pen being empty is held in a substantially upright position with the pen 4 and end of the barrel 1 submerged in the ink with which the pen is to be filled. The cap 8 having been removed, the pumping device 7 may be worked. On compressing the air in the barrel 1 it is forced out through the tube 5, the ports 9 and 10, and the feed-port 3, bubbling up through the ink in the bottle or other container. On releasing the air-pumping apparatus the air is rarefied in the barrel, and the atmospheric pressure on the ink in the container will cause a portion of it to flow up the port 3 into the barrel 1. On the next compression of the air in the barrel it is forced down the tube 5 through the vent 9 and along the port 3, bubbling out through the ink, the opening 10 being, as before described, so small that the frictional resistance holds the ink back in the barrel and permits only the air to escape. This operation is assisted by reason of the tendency of the ink to flow up the barrel and follow the air down the tube 5. I of course realize that a minute portion of ink will necessarily pass out with the air on each compression; but experience has shown that this is so small as to be negligible, the inflow always being many times greater than the outflow. This compression and rarefaction of the air in the barrel is kept up until the air is replaced with ink, when the cap 8 may be replaced and the pen is ready for use. During the pumping action the reservoir or barrel 1 receives its supply of ink almost entirely through the ink-port 10, though according to the size of the pumping device 7 and the rapidity with which it is operated some ink may be drawn in on the suction-stroke through the air-tube 5 and pass out of the upper end of the latter into the reservoir. However, under all conditions the air-port 9 and the ink-port 10 are so formed that the ink-port provides greater frictional resistance for the ink than the air-port for the air on the air-expelling stroke of the pumping device, whereby there will be a more rapid expulsion of air than displacement of ink, so that the ink rapidly gains in volume within the barrel and quickly fills the latter.

I am aware that bulb and piston syringes are in use in fountain-pens, and I claim nothing new with respect to that feature alone; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. A self-filling fountain-pen provided with a pumping device, and separate air and ink ports, the ink-port having a greater frictional resistance for the ink, than the air-port for the air, on the air-expelling stroke of the pumping device.

2. A self-filling fountain-pen provided with a pumping device and separate air and ink ports in communication with the feeder, the ink-port having a greater frictional resistance for the ink, than the air-port for the air, on the air-expelling stroke of the pumping device.

3. A self-filling fountain-pen comprising a barrel, an ink-feeding device at one end thereof provided with an ink-port, a pumping device at the other end thereof, an air-tube within the barrel in an open communication therewith at one end, and an air-port in communication with the ink-feed at the other, the ink-port having a greater frictional resistance for the ink, than the air-port for the air, on the air-expelling stroke of the pumping device.

4. A self-filling fountain-pen comprising a barrel, an ink-feed at one end thereof provided with an ink-port, a pumping device at the other, an air-tube within the barrel and extending the entire length thereof in open communication therewith at each end and provided with an air-port in communication with the feeding device, the ink-port having a greater frictional resistance for the ink, than the air-port for the air, on the air-expelling stroke of the pumping device.

5. A self-filling fountain-pen comprising a barrel, an ink-feeding device at one end thereof having an ink-port therein communicating with the interior of the barrel, and an air-tube extending the entire length thereof, one end of which communicates with the interior of the barrel and the other provided with an air-port communicating with the ink-port, and a pumping device in communication with the air-tube and barrel, the ink-port having a greater frictional resistance for the ink than the air-port for the air, on the air-expelling stroke of the pumping device.

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