Sept. 9, 1924. 1,507,729

A. O. DAHLBERG

FOUNTAIN PEN

Original Filed Sept. 5, 1922

Fig. 1.

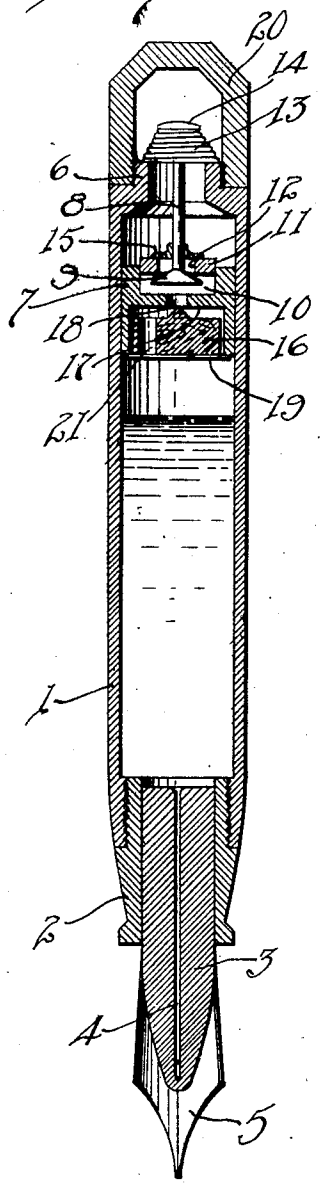
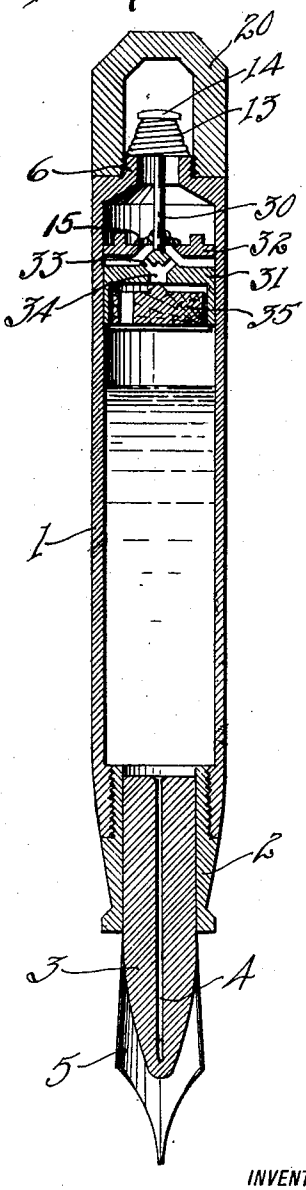


Fig. 2.



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UNITED STATES PATENT OFFICE.

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FOUNTAIN PEN.

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To all whom it may concern:

Be it known that I, ARTHUR OLAUS DAHLBERG, a citizen of the United States, and a resident of Madison, in the county of Dane and State of Wisconsin, have invented a new and useful Improvement in Fountain Pens, of which the following is a full, clear, and exact description.

My invention relates to improvements in fountain pens, and it consists in the combinations, constructions, and arrangements herein described and claimed.

An object of my invention is to provide an improvement over that form of the device shown in my prior patent on Fountain Pen, No. 1,419,026, of June 6, 1922. In said prior patent I disclosed a fountain pen in which the ink is pumped directly into the barrel. The person filling the pen is obliged, however, to keep a close watch as the ink rises in the barrel, because continued pumping, when the barrel is filled with ink, would cause the ink to overflow. The construction of the present device is designed primarily to obviate the disadvantage of having the ink overflow when the barrel is full. To this end I provide automatic means which prevents the overflowing of the ink out of the pumping end of the pen when the pen is filled with ink.

A further object of my invention is to provide a device of the type described which is simple in construction, durable and efficient for the purpose intended, and which is not likely to easily get out of order.

Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings forming part of this application, in which—

Figure 1 is a vertical section through the pen, and

Figure 2 is a vertical section of a modified form of the device.

In carrying out my invention, I provide a barrel 1, having a sleeve 2 in which a member 3 is fixed and provided with a canal 4 for feeding ink contained in the barrel 1 to a pen 5. The opposite end of the barrel 1 is reduced and is provided with an exteriorly threaded neck 6.

A novel ink pumping means and check valve is disposed in the barrel and is adapted to be manually actuated to suck ink into the barrel, and, furthermore, to prevent the ink from passing through the neck 6 when the barrel has been filled with ink. This means comprises a piston 7 which is slidably disposed in the barrel 1, and which is adapted to be actuated by a plunger rod 8. The lower end of the rod 8 is fashioned into a valve 9 which is disposed in a recess 10 of the piston 7. A rubber collar 11 frictionally engages with the wall of the recess 10 and closes the outer end of the recess. The collar 11 is immovably held in the piston 7 and forms a part thereof. The collar permits movement of the valve 9 with respect thereto, the valve being adapted to open and close the opening 12 in the collar.

The piston 7 is shown in lowered position in Figure 1, and the spring 13 is shown compressed. The spring 13 bears on the neck 6 and on the head 14 of the rod 8, and is adapted to move the piston 7 upwardly and to seat the valve 9. The rod 8 has integral lugs 15 which engage with the collar 11 to move the piston downwardly.

A check valve 16 is disposed in a recess 17 of the piston 7 and provides an automatic means for closing the opening 18, which communicates with the recesses 10 and 17, when the barrel 1 has been filled with ink. The valve 16, which is in reality a float, is retained within the recess 17 by means of a wire 19 that is secured to the piston 7.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. In filling the pen with ink, the cap 20 is removed from the neck 6, and the pen inserted into an ink reservoir. The finger of the operator now presses upon the head 14 so as to move the rod 8 and piston 7 into the positions shown in Figure 1. The spring 13 is compressed when the rod 8 is moved downwardly and tends to move the rod 8 back into normal position. The rod 8 in moving downwardly unseats the valve 9 and moves the piston 7 by means of the lugs 15. The air in the barrel 1 passes through the opening 21 in the check float 16, the opening 18, the opening 12, and out through the neck 6. The opening 18 is not closed by the float 16 because the ink is not of sufficient height within the barrel to move the float into closed position. The float is carried by the wire 19. When the rod 8 is released, the spring 13 moves it back into normal position. The upward movement of the

rod 8 first seats the valve 9 and then raises the piston 7. This prevents air from passing through the opening 12 as the piston moves. In other words a vacuum is created within the barrel 1 which draws ink into the barrel.

This operation is repeated until the barrel is filled with ink. In my prior patent, the person filling the pen had to closely watch the level of the ink as it rose within the barrel. When the barrel was filled, the pumping was stopped. Oftentimes, however, the ink would be pumped into the barrel so as to overflow from the neck 6. The check float valve in the present device is designed to obviate this disadvantage. When the barrel is filled with ink, the float 16 is raised so as to close the opening 18. A downward movement of the plunger will not force the ink through the opening 18 and the neck 6, since the opening is closed. The ink will be driven out through the pen point 5. Furthermore it requires greater pressure to force the ink through the duct 4 when the float 16 has closed the opening 18 than it does to pump the ink into the barrel when the opening 18 is opened to permit the passage of the air. This, therefore, provides a ready means by which the operator knows when the pen is filled. The valve 9 is normally seated and prevents the ink from leaking out through the neck 6 when the pen is in use.

In Figure 2 I have shown a slightly modified form of the device. This device is identical to the device heretofore described except that the rod 30 is permanently secured to the piston 31. A disc 32 is slidably mounted in the barrel 1 and is adapted to close the openings 33 in the piston. The openings 33 merge into a common opening 34 which is adapted to be closed by the check valve 35. The other parts of the device are identical to the parts of the preferred form and therefore need no further description.

The operation of the modified form of the device is substantially the same as the preferred form. The piston 31 is moved away from the disc 32 when the head 14 is moved downwardly. This operation uncovers the openings 33 in the same manner as the opening 12 is uncovered. An upward movement of the piston 31 causes the disc 32 to close the openings 33, whereupon the necessary vacuum is created to draw the ink into the barrel.

The pen is simple in construction, and provides a novel means for pumping ink into the barrel, and for preventing the overflow of ink out of the barrel.

I claim:

1. A fountain pen comprising a barrel, a piston slidably disposed within the barrel and having a passage-way for air therethrough, a valve for normally closing one portion of said passage-way, means for simultaneously moving said piston toward the pen and for opening said valve, spring means for moving said piston away from said pen and for simultaneously closing said valve, whereby ink is drawn into the barrel, and a float for closing another portion of said passage-way when the ink in the barrel reaches a predetermined height.

2. The combination with the barrel of a fountain pen having an air inlet at one end, of a piston slidably disposed in said barrel, and having an air passage-way therethrough, a valve for normally closing one end of said passage-way, a rod for opening the valve, means carried by the rod for engaging the piston to move the latter, spring means for retracting the rod, a float carried by the piston and adapted to close said passage-way when the ink in the barrel has reached a predetermined height.

3. A fountain pen comprising a barrel, a piston therein, said piston having an opening therethrough when moved inwardly, and a check valve operated by the liquid within the barrel for closing the opening when the liquid has reached a predetermined level.

4. A fountain pen comprising a barrel having an open end, a piston disposed in said barrel, and having manually controlled means extending through said opening, a valve in said piston adapted to be opened when said piston is moved inwardly, and a float check valve carried by said piston and being adapted to close the passage through said piston when the ink in the barrel reaches a predetermined height.

ARTHUR OLAUS DAHLBERG.