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FOUNTAIN PEN FILLING DEVICE

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The description of the invention is in the drawings and the specification thereof.
My invention relates generally to fountain pen filling devices, and more particularly to improvements in devices of this character which are capable of automatically filling a fountain pen. This application is a division of my co-pending application Serial No. 63,648, filed February 12, 1936, which application is a continuation in part of applications Serial No. 531, 590, filed April 22, 1931, and Serial No. 605,645, filed April 18, 1932.

It is an object of my invention to provide an improved fountain pen filling device which may be manufactured of inexpensive materials, which is simple in construction, and which will operate satisfactorily over a long period of time.

Other objects will appear from the following description, reference being had to the accompanying drawing in which:

Figure 1 is a central vertical sectional view of the fountain pen filling device; and

Figure 2 is a transverse sectional view thereof taken on the line 2--2 of Figure 1.

The device comprises an ink reservoir 10 which is provided with a substantially cylindrical body 12 which has an enlarged head 14 tightly seated in an aperture 16 formed in the top of the reservoir 10. The body 12 has a cylindrical bore 18 in which a piston 20 is slidably mounted. The piston carries a frusto-conical soft rubber sealing member 22 which is adapted to make a sealed connection with the end of a fountain pen. This member has a plurality of sector-shaped flaps 24 formed integrally therewith, these flaps normally lying against each other to close the opening in the bottom of the member 22. The piston has a central bore 26 which is connected by passageways 28 with a peripheral annular groove 30. A passageway 31 connects the bore 26 with the cylinder 18 beneath the piston.

A well 32 which is secured to or formed integrally with the piston body 20 is centrally located in the bore 26 and is adapted to receive the pen point. A tension coil spring 34 has its upper end threaded into an internal helical groove 36 formed at the upper end of the cylinder 18 and has its lower end similarly threaded in a groove 38 formed in the external surface of the piston body 20. This spring thus normally holds the piston in the position shown in Figure 1. The cylinder body 12 has one or more passageways 40 formed in the wall thereof. The upper end of the passageway 40 terminates adjacent the annular groove 30 formed in the body 12 when the latter is in normal upper position, and the lower end of the passageway terminates adjacent the bottom of the reservoir 10. The bottom of the cylinder body 12 is closed by a cap 42, which may be pressed over the lower end of the body. An elbow passageway 44 is formed in the cap 42, the outer end of the passageway being normally closed by a gravity operated check valve 46. The latter is preferably made of glass or similar material and is prevented from moving more than a small distance from its seat by an annular rib 48 formed on the body 12. It is also confined against lateral movement by an upwardly extending flange 50 forming part of the body 42. The interior of the reservoir 10 is maintained at atmospheric pressure by means of a vent passageway 52 formed in the head 14.

In operating the device, a fountain pen is inserted in the soft rubber seat 22 so that the end of its section makes an air-tight seal with the internal frusto-conical surface of the seal. The nib of the pen readily swings the flaps 24 out of the way and passes into the center of the well 32. The spring 34 is under sufficient initial tension so that a pen may be inserted as stated without moving the piston 20. However, upon continued downward movement of the pen, the piston 20 will be moved downwardly, forcing the ink contained in the cylinder 18 outwardly through the duct 44 past the check valve 46. Upon freeing the pen, the spring 34 will contract, drawing the piston 20 upwardly, creating a partial vacuum in the lower end of the cylinder 18, which reduction in pressure is communicated to the bore 26 through the passageway 31. The contents of the reservoir of a fountain pen will thus be exhausted and discharged into the well 32.

When the piston 20 reaches the upper end of its stroke, as shown in Figure 1, the annular groove 30 registers with the upper end of the ink passageway 40 and as a result, ink from the container 10 is drawn into the cylinder 26 and fills the well 32 so that as the pressure within the cylinder 26 (as well as in the cylinder 18) approaches atmospheric pressure, the ink may flow into the reservoir of the fountain pen.

With pens of the rubber sac type filling mechanism, the sac may be completely filled with one stroke of the piston, but with pens having a suction type of filling mechanism, it may be necessary to operate the device two or three times in order to secure substantially complete filling of the reservoir of the pen. After the pen has been filled, it may be removed from the pen seat, and it will be found that the nib and the end surfaces of the section are the only parts of the pen which have been wetted by the ink. Thus, a fountain pen may be very quickly and easily filled without
the usual necessity for cleaning ink from parts of
the pen which have been immersed in the ink.
While I have shown and described a particular
embodiment of my invention, it will be apparent
to those skilled in the art that variations and
modifications thereof may be made without de-
parting from the underlying principle thereof.
I therefore desire, by the following claims, to in-
clude within the scope of my invention all such
equivalent constructions whereby substantially the results of my invention may be
obtained by substantially the same means.

I claim:
1. In a fountain pen filling device, the com-
bination of a container, a cylinder projecting into
said container to a point adjacent the bottom
thereof, said cylinder having an inlet passageway
leading from a point intermediate the ends
thereof to the lower end thereof, a piston recipro-
cable in said cylinder, a closure for the end of
said cylinder, said closure having an outlet pas-
sgeway, a check valve normally closing the end
of said outlet passageway, an aperture pen seat
carried by said piston, and a tension spring hav-
ing its ends connected respectively to said cylin-
der and to said piston.

2. In a filling device for fountain pens, the
combination of a body having a closed end cy-
indrical bore therein, said body being provided with a passage-
way for supplying ink to the central portion of said bore, a closure for the lower end of said body,
said closure being provided with an outlet port, a
check valve closing said outlet port, a piston re-
ciprocable in the bore of said body, said piston
having an annular groove formed therein and
having passageways connecting said groove with
the well therein, a pen seat on said piston, and a
tension spring secured respectively to said piston
and said body and operable to raise said piston
to the upper end of the bore in said body.

3. In a fountain pen filling device, the com-
bination of a container, a body insertable in said
container and having a cylindrical bore formed
therein, means for conveying ink to said cylin-
drical bore at a point intermediate its ends, a
closure for the bottom of said bore, said closure
having an outlet port therein, a check valve nor-
mally closing said outlet port, a cup-like piston reci-
crocable in said cylindrical bore, said piston
having the hollow interior thereof connected by a passageway with an annular groove
formed in its external surface and with the por-
tion of said cylindrical bore below the piston, and
a tension spring connecting said body and said
piston and arranged to be stretched upon down-
ward movement of said piston and to draw said
piston upwardly to cause a partial vacuum in the
lower portion of said cylinder and in the reser-
voir of a pen connected to the cup portion of said
cylinder.

4. In a fountain pen filling device, the com-
bination of a container, a closed end cylinder
projecting into said container to a point adja-
cent the bottom thereof, said cylinder having an
inlet passageway leading from a point inter-
mediate the ends thereof to the lower end thereof
and having an outlet passageway in the closed
end thereof, a piston reciprocable in said cylin-
der, a check valve normally closing the said out-
let passageway, an aperture pen seat carried by
said piston, and a tension spring having its ends
connected respectively to said cylinder and to
said piston.

5. In a filling device for fountain pens, the
combination of a body having a closed end cy-
indrical bore therein, said body being provided with a passageway for supplying ink to the cen-
tral portion of said bore, said cylinder being pro-
duced with an outlet port, a gravity operated
check valve closing said outlet port, a piston re-
ciprocable in the bore of said body, said piston
having an annular groove formed therein and
having passageways connecting said groove with
the well therein, a pen seat on said piston, a well
in said piston, and a tension spring secured re-
spectively to said piston and said body and oper-
able to raise said piston to the upper end of the
bore in said body.

6. In a fountain pen filling device, the com-
bination of a container, a body insertable in said
container and having a closed end cylindrical
bore formed therein, means for conveying ink to
said cylindrical bore at a point intermediate its
ends, said body having an outlet port therein, a
check valve normally closing said outlet port, a
cup-like piston reciprocable in said cylindrical
bore, said piston having an annular groove
formed in its external surface and having the
hollow interior portion thereof connected with
said groove by a passageway and connected with
the portion of said cylindrical bore below the pis-
ton by a second passageway, and resilient means
connecting said body and said piston and ar-
 ranged to be stretched upon downward movement
of said piston and to draw said piston upwardly
to cause a partial vacuum in the lower portion
of said cylinder and in the reservoir of a pen con-
 nected to the hollow part of said piston.

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