Nov. 24, 1936. J. D. GOBLE 2,062,022

INKWELL

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Fig. 1.

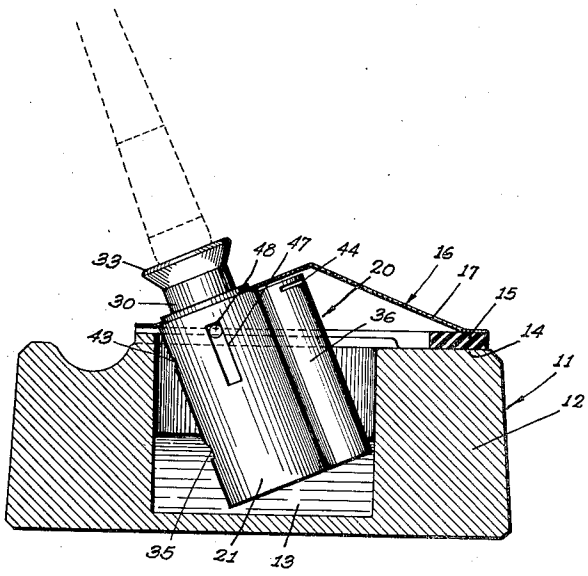


Fig. 2.

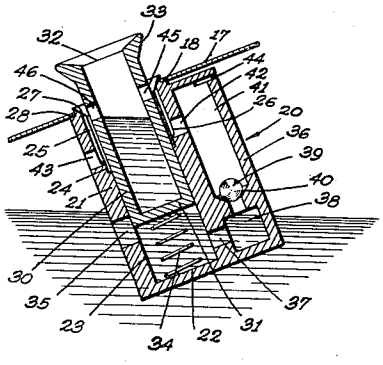
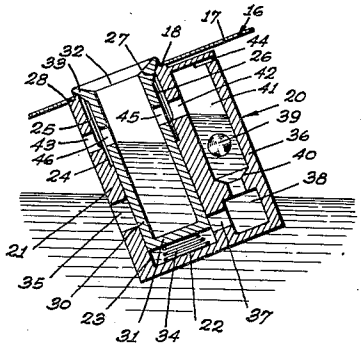


Fig. 3.



Inventor
J. D. Goble
by Hazard and Miller
Attorneys.

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INKWELL

James D. Goble, Los Angeles, Calif.

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6 Claims. (Cl. 120—61)

My invention relates to an improvement in inkwells, whereby a pen may be always dipped in a body of ink of the same or constant depth and therefore when the ordinary dip pen is used, the pen will take up a constant amount of ink, provided it is inserted to the same depth. This overcomes objections to the ordinary dip pens with the type of inkwell which may be depleted in that a full amount of ink cannot be obtained with each dipping of the pen.

Another advantage of my invention is that for refilling fountain pens the pen may be inserted in a body of ink, always over a constant depth and therefore having the same immersion for the pen, it may always be adequately filled.

An object and feature of my invention in connection with an inkwell is in the use of a pump which may be actuated in inserting the pen or dipping it in a movable part of the well to positively pump a certain amount of ink from the reservoir of the inkwell into a receptacle in which the pen is dipped. Thus a constant quantity or depth of ink may be maintained in this receptacle so that the pen may obtain a full charge of ink at each dipping.

Another object and feature of my invention in an inkwell, is combining the receptacle for ink in which the pen is dipped with a pump plunger or pump barrel, the barrel or plunger being operative when depressed to positively pump or force ink from the inkwell into the receptacle of the pump plunger or barrel, such plunger or barrel being made with a closed door and open at the top for inserting the pen.

A further feature of my invention is providing a pump structure with a passage having a check valve so that when the descending plunger pumps the ink from the lower part of the inkwell into the passage, which is in the form of an upwardly extending tube, the ink which passes the check valve is trapped and prevented from flowing back to the reservoir of the inkwell. The plunger or pump barrel is provided with a port communicating with the passage so that on its depression ink flows from the upper part of the passage above the check valve into the hollow plunger. The ink is maintained at a constant level in the plunger by means of an overflow; this being a second port in the pump plunger, or the intake port may have the function of an overflow to maintain the constant level of ink in the pump barrel. Such level is below the ports above the bottom of the plunger.

Another feature of my invention comprises operating the pump plunger in a pump cylinder, which with the upward passage for ink may be considered as a unit for insertion in an inkwell. The pump cylinder has an inlet port for ink leading to the portion of the cylinder before the closed end of the pump barrel, the pump barrel being normally elevated by a compression spring seated on the bottom or closed end of the cylinder and pressing upwardly against the closed bottom end of the pump plunger. The pump plunger is limited in its stroke in compressing the spring and in being forced upwardly by the spring.

My invention is illustrated in connection with the accompanying drawing, in which,

Fig. 1 is a vertical section through an inkwell with the pump inserted therein being shown in elevation.

Fig. 2 is a vertical section of the pump structure with the plunger receptacle elevated in position for dipping a pen.

Fig. 3 is a section similar to Fig. 2 with the plunger receptacle depressed in position for replenishing the ink.

In the drawing, the inkwell as a whole is indicated by the numeral 11. This has a substantial body structure 12 with a reservoir 13. The top 14 of the inkwell is preferably fitted with a packing 15, this generally being made of rubber and on this packing there is a cover 16. The cover is made with a sloping surface 17, this being provided with an opening 18 for a purpose hereinunder detailed.

The pump assembly 20 includes a cylinder 21 closed at the bottom 22, having a lower bore 23, an upper bore 24 of slightly greater diameter and vertical grooves 25 on one side, 26 on the other. The upper end of the cylinder is preferably outwardly bevelled as indicated at 27 and is provided with a shoulder 28 to fit in the opening 18 and engage the top 17. Thus the top holds the pump assembly at an inclination in the reservoir of the inkwell.

Slidably mounted in the cylinder there is a pump plunger or barrel 30; this being preferably cylindrical, closed at its lower end 31, open at its upper end 32 and having a bevel rim 33, which if desired may contact with the bevel 27 of the cylinder. A compression spring 34 engages the bottom 22 of the cylinder and the bottom 31 of the plunger and normally maintains the plunger elevated in the position shown in Fig. 2.

A supply opening 35 is located in the cylinder above the bottom and a passage structure 36 is preferably formed integral with the cylinder structure. This has a connecting lower passage structure 37 from the bottom of the cylinder to

a well **38**. A check valve **39** bears on a seat **40** and the upper portion of the passage **41** connects by a port **42** to the interior of the cylinder in the section having the enlarged bore **24** and the vertical groove **26**. The opposite or lower inclined side of the cylinder has an outlet or overflow port **43**, also communicating with the section **24** of larger diameter and at the bottom of the groove **25**. The structure forming the passage is provided with an overflow port **44** at its top.

The plunger is provided with an inlet port **45** and with an outlet port **46**. Such plunger is guided in a rectilinear motion by providing the cylinder with a slot **47** through which extends a pin **48**, such pin being secured to the plunger.

The manner of operation and functioning of my invention is substantially as follows: Preferably the pump structure is mounted so that the plunger is inclined as shown in Figs. 1, 2 and 3; however, it may be vertical if desired. When the plunger is elevated by the spring **34**, ink may flow from the reservoir **13** through the inlet opening **35** of the cylinder into the base of the cylinder, through the passage **37** into the well **38**, filling these to the level of the ink in the reservoir **13**. When the plunger is depressed, the ink trapped on the bottom of the cylinder below the inlet opening **35** is forced through the passage **37**, the well **38**, past the check valve **39**, through the upper part of the passage **41** and when the plunger is depressed the inlet port **45** of the plunger registers with the port **42** connecting the passage and the cylinder and ink flows from the upper part of the passage **41** into the plunger.

The ink can only fill the hollow plunger however, to the lower edge of the overflow port **46** and should the ink be higher than this, when the plunger is depressed, it will overflow through the port **46** of the plunger and the overflow port **43** of the cylinder, these being in registry when the plunger is depressed as shown in Fig. 3. However, should there be insufficient time for the ink to flow out of the receptacle in the plunger, when the plunger is depressed it will flow through the overflow port **46** of the plunger and pass downwardly in the groove **25**, the enlarged upper part of the bore of the cylinder and out through the overflow port **43**. Thus when the plunger is elevated in the position of Fig. 2, the ink has a constant depth in the receptacle formed by the plunger, this depth being regulated by the distance between the bottom **31** of the plunger and the overflow port **46**.

The overflow port **44** in the passage of the pump barrel is provided to take care of any excess ink which might be forced upwardly through the check valve over that required to fill the plunger and beyond the amount of ink which can flow outwardly when the plunger is elevated through the port **42** into the groove **26** around the enlarged bore **24** and out through the port **43** of the cylinder, back into the reservoir.

Various changes may be made in the details of construction without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. In a device as described, the combination of an inkwell forming a reservoir, a pump having an inlet to the reservoir, a depressible plunger, a first structure attached to the pump forming a passage from below the plunger, a second structure having a receptacle connected to the plunger, a connection from the said passage to the receptacle whereby on depression of the plunger ink is forced into the receptacle, the said receptacle being open at the top for the insertion of a pen.

2. In a device as described, the combination of an inkwell forming a reservoir, a pump having a cylinder with an inlet at the bottom, a plunger open at the top and closed at the bottom and forming a receptacle, said plunger having a port, a structure forming a passage connected from the bottom of the cylinder to the said port, whereby on depression of the plunger ink is forced from the reservoir to the receptacle, the cylinder and the plunger having complementary outflow ports whereby surplus ink in the receptacle may overflow through said ports back to the reservoir.

3. In a device as described, the combination of an inkwell forming a reservoir, a pump having a cylinder with an inlet at the bottom, a plunger open at the top and closed at the bottom and forming a receptacle, said plunger having a port in one side, a structure attached to one side of the pump cylinder forming a passage connected from the bottom of the cylinder to the said port, whereby on depression of the plunger ink is forced from the reservoir to the receptacle.

4. In a device as claimed in claim 3 the structure forming the passage having a check valve and an overflow port at the top, whereby surplus ink forced upwardly through the passage by the depression of the plunger may flow outwardly from the overflow of the passage.

5. In a device as described, the combination of an inkwell forming a reservoir, a pump having a cylinder with an inlet connection to the reservoir at the bottom, an outlet connection at the bottom, a structure attached to one side of the pump cylinder forming a vertical passage having an upper port, a plunger in the cylinder closed at the bottom and open at the top and having an upper port to register with the port of the passage, means normally elevating the plunger, the said plunger being depressible to force ink below the plunger upwardly through the passage and through the upper port of the cylinder to the port of the plunger, the portion of the plunger above the bottom forming a receptacle for ink.

6. In a device as claimed in claim 5, the cylinder and the plunger having complementary overflow ports, said ports being out of registry when the plunger is elevated and brought into registry when the port from the plunger registers with the port from the passage.

JAMES D. GOBLE.