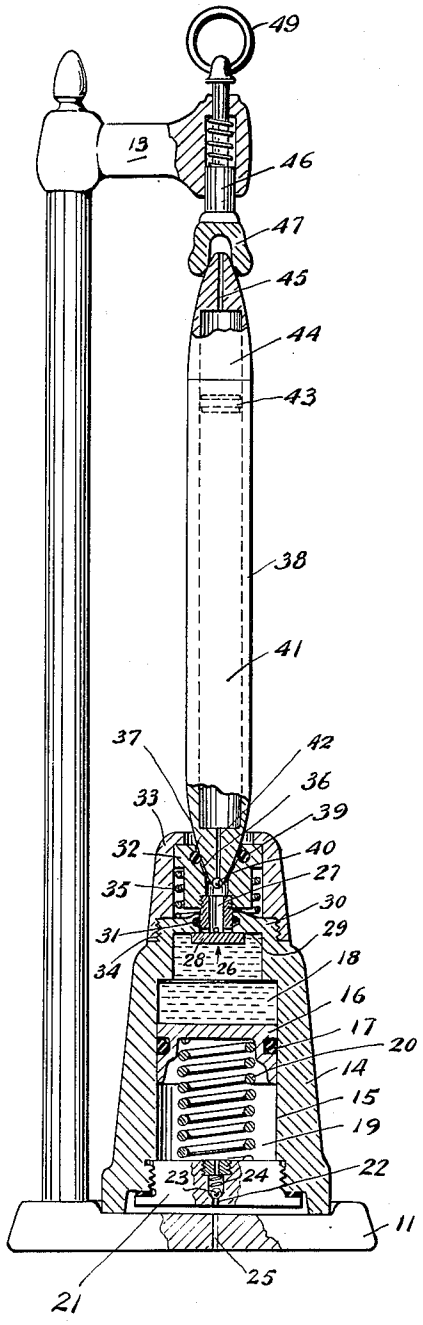
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APPARATUS FOR FILLING WRITING IMPLEMENTS

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APPARATUS FOR FILLING WRITING IMPLEMENTS

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2 Claims. (Cl. 226—63)

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This invention relates to writing implements or pens of the ball point type. The invention provides a method of filling or refilling such implements with writing fluid and provides automatic apparatus for performing the said method.

Ball point pens usually comprise a hollow barrel containing a writing fluid, generally thickened ink which is fed to the ball point proper through a narrow passage. The ball point proper consists of a small ball resting in a suitable socket with freedom to roll freely over a writing surface. Capillary action of the narrow passage feeds ink to the ball and as the ball revolves in its socket during the process of writing its surface is constantly wetted with ink from the passage and the ink then deposited on the writing surface.

Conventional ball point pens are usually sold filled with writing fluid or ink sufficient for one or two years of normal use. After the supply is exhausted the customer is usually required to return his pen to the manufacturer for refilling which is generally done after partial disassembly of the pen. Other conventional types of pens include an exchangeable reservoir or cartridge which can be replaced. Such cartridges however decrease the useful space provided for ink with the result that cartridge type pens require more frequent refilling.

The invention provides apparatus for the convenient and automatic filling and refilling with fluid of implements of the aforementioned type. The apparatus obviates the necessity of disassembling pens as was done heretofore.

The objects, features and advantages of this invention will appear more fully from the detailed description which follows, accompanied by drawings showing for the purpose of illustration a preferred embodiment of the invention.

The invention also consists in certain new and original features of construction and combination of parts, hereinafter set forth and claimed.

Although the characteristic features of this invention which are believed to be novel will be particularly pointed out in the claims appended hereto, the invention itself, its objects and advantages and the manner in which it may be carried out may be better understood by referring to the following description taken in connection with the accompanying drawing forming a part of it in which the figure is an elevational side view, partly in section, of a device for the filling of implements of the aforementioned type.

In the following description and in the claims various details will be identified by specific names

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for convenience. The names, however, are intended to be as generic in their application as the art will permit.

Like reference characters refer to like parts in the figure of the drawing.

In the drawing accompanying, and forming part of, this specification certain specific disclosure of the invention is made for the purpose of explanation of broader aspects of the invention, but it is understood that the details may be modified in various respects without departure from the principles of the invention and that the invention may be applied to other structures than the one shown.

The device shown in the figure comprises a base 11 to which a post 12 is secured carrying a cross head 13. The base carries a housing 14 having an inside cylindrical space 15 in which a plunger 16 is movable. The plunger carries a gasket or ring 17 sealing it against the cylinder walls and subdivides the space 15 into two chambers 18 and 19. The upper chamber 18 serves as a reservoir for writing fluid such as thickened ink while the lower chamber 19 houses a relatively powerful compression spring 20 resting with one end against a bottom plug 21 closing the cylindrical space and bearing with the other end against the underside of the plunger 16 urging the plunger upwardly.

The lower chamber 19 is vented to the outside through a vent passage 22 controlled by a check valve 23 loaded by a spring 24. The check valve admits air into the lower chamber 19 as the plunger 16 moves upwardly and may be opened against the action of the spring 24 when the ink chamber 18 is being refilled by inserting a pin through an aperture 25 in the base in line with the vent passage 21.

The ink chamber 18 is closed at the top by an outlet valve 26. The valve 26 comprises a tubular element 27 having an enlarged head 28 which forms a valve member and seals against a seat 29 in the top wall 30 of the chamber 18. The tubular element 27 extends through a gasket or packing 31 in the top wall 30 of the housing and is secured with its upper end in a head piece 32 vertically movable in a cap 33 screwed to the housing at 34. A plurality of passages extend through the tubular element 27 near its head permitting fluid to flow into the interior of the member when the valve member 28 is lifted off its seat 29.

The head piece 32 is under the action of a compression spring 35 tending to maintain the valve 26 closed and provides a seat 36 for the tapered

end 37 of a pen 38. The tapered end 37 of the pen 38 is tightly sealed with respect to the head piece by a gasket 39.

The pen 38 may be of conventional construction and comprises in the illustrated example a ball point 40 communicating with an ink chamber 41 in the pen barrel through a capillary passage 42. The liquid in the ink chamber is confined by a movable plunger 43, and the space 44 above the plunger is vented to the outside through a vent passage 45.

The crosshead 13 on the post 12 carries a vertically movable stem 46 having an enlarged end 47 adapted to receive the end of the pen 38. The stem is under action of a spring 48 and carries a finger operable ring 49, whereby the stem may be moved vertically for insertion of the pen into, or removal of a pen from, the filling device.

The device is prepared for the filling of writing implements by filling its chamber 18 with appropriate fluid, for example, concentrated ink. When the chamber 18 is filled the plunger 16 is in a depressed position and the spring 20 is under tension, maintaining the fluid under relatively high pressure.

When a pen is to be filled, it is inserted between the head piece 32 and the vertically movable stem 46. The pen is then automatically centered and its tapered lower end rests against the gasket 39 in the head piece 32. For the actual filling the pen is depressed by hand causing the head piece 32 to move downwardly whereby the outlet valve 26 for the fluid is opened. The fluid now flows into the interior of the pen, the pressure of the fluid being sufficient for the fluid to overcome the flow resistance of the ball point 40 and of the capillary passage 42.

As fluid is being forced into the pen, air enters through the check valve 23 into the space below the plunger 16. Similarly the plunger 43 in the pen barrel moves upwardly and air is expelled through the vent passage 45.

After sufficient time has elapsed the pen is released, permitting the spring 35 of the head piece 32 to shut the outlet valve. The flow of fluid is now interrupted and the pen may be removed from the device.

Obviously the present invention is not restricted to the particular embodiments herein shown and described. It is evident that the invention may be practiced by other devices than the one shown. Also various changes, additions, omissions, substitutions and other modifications may be made in the device without departure from the spirit and essence of the invention.

What is claimed is:

1. Apparatus for the pressure filling with fluid of writing implements of the type having a hollow barrel, a movable wall therein and a ball point communicating with the interior of said hollow barrel through a capillary passage, the apparatus comprising, a cylinder; a piston therein subdividing said cylinder into two chambers; a spring in one of the chambers urging the piston in a direction to reduce the volume of said other chamber; an outlet valve for said other chamber; means for urging said valve towards its closed position; a movable member for opening said valve; said movable member providing a pressure tight seal for the barrel of said writing implement adjacent said ball point.

2. Apparatus for the pressure filling with fluid of writing implements of the type having a hollow barrel, a movable wall therein and a ball point communicating with the interior of said hollow barrel through a capillary passage, the apparatus comprising, a reservoir for writing fluid; means for maintaining said fluid under pressure in said reservoir; an outlet valve for said reservoir, said valve including a movable valve element biased towards valve closing position; and a movable member for moving said element towards its open position, said member including a pressure tight seating surface for engaging the barrel of said writing implement adjacent said ball point.

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