

PATENT SPECIFICATION

581,290



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PROVISIONAL SPECIFICATION

Self-filling Fountain Pens

We, WYVERN FOUNTAIN PEN COMPANY LIMITED, a British Company, of Woodboy Street, Leicester, and MARK SYDNEY FINBURGH and WILLIAM THOMAS HIGGINS, both British Subjects of the Company's address, do hereby declare the nature of this invention to be as follows:—

The invention relates to fountain pens of the kind in which a plunger of some kind is arranged to be moved into the interior of the pen in order to decrease the volume thereof and so expel air and any remaining fluid, and to be returned by spring means so as to reduce pressure, or create a partial vacuum, within the pen for drawing ink (in which the pen point is immersed) into the storage space.

The present invention seeks to give the maximum capacity for any given size of pen and to avoid as far as possible the presence of any metal parts: springs, slotted guides, or the like.

The invention consists in the use between a part at one end of the pen barrel and the end of the filling plunger within the barrel of an elastic and extensible cylinder made of rubber which cylinder is extended axially as the filling plunger is depressed and by its elasticity, itself forms the means as it regains its normal cylindrical form, of returning the plunger when the latter is released. The cylinder accordingly operates as the return spring and to prevent leakage around the plunger.

The plunger is preferably tubular and is closed at its outer end, but open at its inner end and the rubber cylinder is secured to it so as to surround this open end. The interior of the plunger thus adds to the fluid capacity of the pen barrel.

Further, in the normal position of use of the pen, the filling plunger with its closed end projecting from the barrel and its inner, open end occupying its outermost position relatively to the barrel, the rubber is either relieved of tension or is under minimum tension.

In a convenient constructional embodiment the pen barrel is made in one piece, closed at one end by a nib section having a spigot part which enters and stiffens

this end of the barrel; or the nib section may be cemented to the end of the barrel and to a stiffening collar inserted therein. In the nib section provision is made for the reception of the pen nib and for the supply of ink to the nib and an inlet for air to the barrel. An air tube continues from this part along the barrel and terminates preferably just within the mouth of the tubular plunger arranged at the other end of the barrel. This plunger is closed at its outer end which normally projects for say about half its length from the barrel and it carries at its front end around the mouth an attachment rim around which the one end of a rubber cylinder is secured.

Instead of providing a thickened attachment rim around the mouth of the plunger a thickening of the wall of the rubber tube at its attachment point can be provided. For further security against detachment or the escape of fluid between the plunger and the interior of the rubber cylinder a moulded in-turned lip may be provided on the cylinder and secured by adhesion to the face of the plunger.

The hollow plunger is made a free sliding fit in a gland nut screwed into the end of the barrel, and provision is made between this gland nut and a part integral with, or secured to, the barrel so that the outer end of the rubber cylinder may be stretched over part of the gland nut (for example, over a conical projection thereof) and clamped against a corresponding part inside the barrel. The gland nut may also conveniently be made with an outward extension around the plunger which may receive the usual enclosure cap, for example, by being screwed in place thereon. When filling the pen after the removal of the cap over the plunger manual pressure on the plunger in the ordinary way stretches the rubber cylinder which acts as a liquid-tight and airtight non-corrodible spring for returning the plunger on the release of the latter.

The arrangement provides a simple and convenient construction free from metallic springs and providing maximum ink-holding capacity for which practically the whole of the barrel, into the nib section,

[Price 1/-]

and also the interior of the plunger are available.

Dated this 23rd day of August, 1944.

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COMPLETE SPECIFICATION

Self-filling Fountain Pens

We, WYVERN FOUNTAIN PEN COMPANY LIMITED, a British Company, of Woodboy Street, Leicester, and MARK SYDNEY FINBURGH and WILLIAM THOMAS HIGGINS, both British Subjects of the Company's address, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to fountain pens of the type in which a plunger is movable into the interior of the pen in order to decrease the volume of the storage space therein and is returnable automatically so as to create a partial vacuum and consequent suction at the nib for filling purposes and in which an annular diaphragm or sleeve of flexible material extends between the plunger and the barrel and forms, or assists in forming, the means for returning the plunger to normal position.

The object of the invention is generally to improve the construction of this type of pen and in particular to provide maximum capacity, since although it may not be possible to fill the whole interior of the pen with ink, the greater the volume of air it can contain the greater the volume of ink it is possible to suck up into it.

In accordance with the invention, the plunger is formed with an internal cavity for ink, which cavity both communicates with the interior of the barrel and also projects outside the barrel. As the released position of the plunger, wherein the rubber is relieved of tension, or under minimum tension, is that which it normally occupies i.e. when the pen is in use, the larger part of the combined interior of both barrel and plunger can thus be made available as a space into which the greatest possible quantity of ink can be introduced in proportion to the dimensions of the pen.

One convenient constructional embodiment of the invention is illustrated by way of example in the accompanying drawings whereof:—

Figure 1 is a longitudinal section of a pen showing the plunger in released position and the pen ready for normal use, whilst

Figure 2 is a similar view with the plunger depressed.

The barrel 1 is made integrally and closed at one end by a nib support 2 having a spigot part 3 which enters and stiffens this end of the barrel. The nib 4 is secured to the nib support 2 by means of a band clip 5 adjacent the end of the barrel and concealed beneath the nib is a feed channel 6 on the surface of the support, which channel is fed by duct 7 from the interior storage space, an air tube 8 mounted in the support also being in communication with channel 6 through a second duct 9.

In the other end of barrel 1 the plunger 10 is supported axially thereof, being a free sliding fit in gland nut 11 engaging in the internally tapped collar 12 fixed in the end of the barrel. Plunger 10 is made hollow and its outer end closed. To an attachment rim 13 around the open inner end of the plunger is secured a moulded in-turned lip at one end of the rubber diaphragm sleeve 14 whose other end is gripped between conical unscrewed inner clamping faces of nut 11 and collar 12. When the plunger is released as shown in Figure 1 its inner end is left projecting into the barrel only so far as is required by the length of sleeve 14 when relieved of axial tension. Similarly the outer end of the released plunger projects sufficiently to ensure that when it is depressed to the position shown in Figure 2 the sleeve becomes suitably elongated or stretched.

In order to cover the projecting end of the released plunger and to prevent unintentional depression thereof, cap 15 may be screwed in place on an extension of nut 11. The air tube 8 preferably terminates just within the open mouth of the tubular plunger 10 when in its released position.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A fountain pen of the type set forth, wherein the plunger is formed with an internal cavity for ink, which cavity both communicates with the interior of the barrel and also extends into that part of the plunger projecting outside the barrel.

2. A fountain pen as claimed in Claim 1, substantially as described herein with reference to the accompanying drawings.

Dated this 3rd day of July, 1945.

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[This Drawing is a reproduction of the Original on a reduced scale.]

FIG. 1

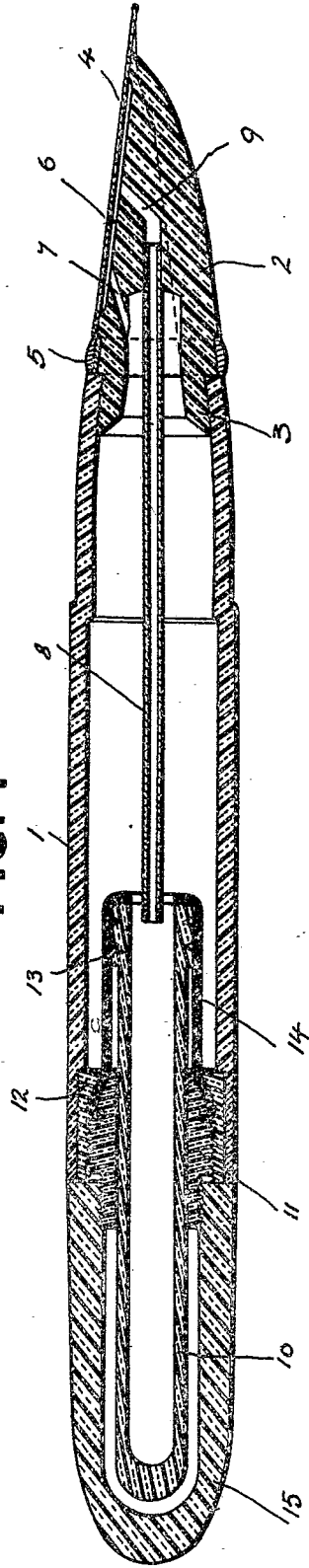


FIG. 2

