PATENT SPECIFICATION

Application Date: June 6, 1936. No. 15921/36. **475,970**

Complete Specification Left: May 13, 1937.

Complete Specification Accepted: Nov. 30, 1937.

PROVISIONAL SPECIFICATION

Improvements in or relating to Self-filling Fountain Pens

We, MENTMORE MANUFACTURING CO., LIMITED, a Company Registered under the laws of Great Britain, of Tudor Grove, Well Street, Hackney, London, E.9, and WILLIAM FREDERICK JOHNSON, a Subject of the King of Great Britain, of 13, Merrick Square, London, S.E.1, do hereby declare the nature of this invention to be as follows:—

This invention relates to self-filling fountain pens of the type (hereinafter referred to as the type specified) in which the barrel of the pen itself acts as the ink reservoir and has a collapsible bag attached to the end remote from that at which the feed section is located, and in which an air tube extends longitudinally of the barrel to open to the end of the latter adjacent the feed section.

The main object of the present invention is to provide a pen of this type which shall have improved and simple means for collapsing the bag and which shall be of cheap construction.

According to one feature of the invention a self-filling fountain pen of the type specified has the collapsible bag located within a space or chamber and is provided with means for varying the pressure within the space or chamber for collapsing the bag.

According to another feature of the invention the ink-reservoir portion of the barrel carries an extension surrounding the collapsible bag and a member is displaceably mounted within the extension as a substantially air-tight fit so that displacements of the said member shall cause collapse, and expanion of the bag.

A further feature is the provision of a displaceable member in the form of a plunger cylinder adapted to telescope into the extension on the barrel over the collapsible bag.

In order that the nature of the invention may be clearly understood, there will now be described, by way of example, one way in which it may be carried into effect.

A pen having a translucent or transparent barrel, which itself acts as an ink reservoir, is provided at the one end (hereinafter refered to as the lower end) with a feed section of usual form that carries the feed and nib. Formed integrally with the upper end of the barrel is a plug through which is a central hole having engaged therein the upper end of an air tube that extends longitudinally of the barrel to terminate adjacent the feed section. A breathing or choke channel is formed in the outer surface of the tube to provide a small breathing hole connecting the interior of the upper end of the barrel with the interior of an elongated collapsible bag fitted over an upwardly directed reduced portion of the plug. The bag is preferably of rubber and constructed so that it normally tends to retain its bag form.

The plug is screw-threaded externally for the reception of a tubular element which constitutes an extension of the barrel and surrounds the collapsible bag. Within this element is telescoped, as a substantially air-tight fit, a plunger member which is preferably a tube having its upper or outer end suitably plugged. The hollow part of the plunger is adapted to accommodate the collapsible bag when the parts are telescoped together.

At its upper end the plunger is preferably externally threaded so that it may be screwed into the internally threaded mouth of the extension on the barrel, after it has been pushed right home in the said extension. It will be understood that the telescoping parts may be provided with suitable flanges or the like to limit their movement relatively to each other in the separating direction.

In filling the pen, the plunger member is unscrewed from the mouth of the extension, drawn out therefrom to its fullest extent and then reciprocated a few times. Each inward movement of the plunger causes a rise of pressure in the space surrounding the collapsible bag and the latter is thereby collapsed, whereas each outward movement of the plunger again reduces the pressure and allows the bag to expand due to its own inherent tendency.

A spring may be provided around the bag to tend to urge the plunger outwardly and other modifications may also be made, for example, the breathing or

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choke channel may be formed in the plug at the upper end of the barrel, either in the wall of the hole therethrough or through the body of the plug, and packing means may be provided on the plunger member, if desired.

It is found in some cases that the first part of each inward movement of the plunger during the filling of the pen causes a rise of pressure in the space surrounding the collapsible bag to a definite value and that the subsequent portion of the said inward movement causes expulsion of air from the said space around the sides of the plunger with the result that the bag is first collapsed and then allowed to expand during each inward movement of the plunger.

It is to be understood that ink may also pass into the collapsible bag during the filling of the pen, after the barrel itself has been filled.

Dated this 6th day of June, 1936.
For the Applicants,
RAWORTH, MOSS & COOK,
75, Victoria Street, London, S.W.1.
Chartered Patent Agents.

COMPLETE SPECIFICATION

Improvements in or relating to Self-filling Fountain Pens

We, MENTMORE MANUFACTURING CO., LIMITED, a Company Registered under the laws of Great Britain, of Tudor Grove, Well Street, Hackney, London, E.9, and WILLIAM FREDERICK JOHNSON, a Subject of the King of Great Britain, of 13, Merrick Square, London, S.E.1, 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 self-filling fountain pens of the type (hereinafter referred to as the type specified) in which a collapsible bag is collapsed and expanded for self-filling purposes by pneumatic action produced by telescopically engaged parts enclosing the said bag. An object of the invention is to provide a pen of this type which is of inexpensive construction and which is easy to operate.

According to the invention, a self-filling fountain pen of the type specified comprises a barrel which itself constitutes the whole or the principal part of the ink reservoir, an extension of the barrel containing the collapsible bag, a longitudinal air tube opening into the bag at the end thereof which is adjacent to the barrel and into the barrel at the end thereof which receives the feed section, and a member telescopically engaged with the extension so as to enclose the bag and adapted by its displacement for collapsing and expanding the bag by pneumatic action and without contact therewith. The displaceable member may have the form of a plunger cylinder adapted to telescope inside the extension and over the collapsible bag.

In order that the nature of the invention may be clearly understood, one way in which it may be carried into effect will now be described by way of example and with reference to the accompanying drawing, in which:—

Fig. 1 is a longitudinal axial section of a pen in accordance with the invention with the bag shown in the collapsed condition, and

Fig. 2 is a similar view, showing the bag expanded.

A pen having a translucent or transparent barrel 1, which itself acts as an ink reservoir, is provided at the one end (hereinafter referred to as the lower end) with a feed section 2 of usual form that carries the feed and nib. Fitted in or formed integrally with the upper end of the barrel is a plug 3 through which is a central hole 4 having engaged therein the upper end of an air tube 5 that extends longitudinally of the barrel to terminate adjacent the feed section 2. A breathing or choke channel 6 is formed in the wall of the hole 4 or in the outer surface of the tube 5 to provide a small breathing hole connecting the interior of the upper end of the barrel 1 with the interior of an elongated collapsible bag 7 fitted over an upwardly directed reduced portion 8 of the plug 3. This plug-portion may be waisted, as illustrated, to facilitate attachment of the bag. The bag is preferably of rubber and constructed so that it normally tends to retain its bag form.

The upper end 9 of the barrel 1 is screw-threaded externally for the reception of a tubular element 10 which constitutes an extension of the said barrel and surrounds the collapsible bag 7. Alternatively, if the un-reduced portion of the plug 3 projects above the edge of the barrel 1, the former may be externally threaded for the purpose stated. Within the element 10 is telescoped, with a fairly tight fit, a plunger member 11 which is preferably, as illustrated, a cylinder or tube having its upper end closed or suitably plugged. The hollow part of the plunger 11 is adapted to accommodate the collapsible bag 7 when the parts 10, 11

are telescoped together. The plunger is guided in an externally threaded bushing 12 screwed into the upper end of the barrel-extension 10. At its upper end, the plunger is secured in a cap 13 which is internally threaded at 14 to screw upon the upper end of the bushing 12 projecting from the barrel-extension 10. Alternatively the plunger itself may be externally threarer at its upper end so that it may be screwed into an internally threaded mouth of the barrel-extension after it has been pushed right home in the said extension. The parts 10 or 12 and 11 are provided with suitable flanges, shoulders or the like to limit their movement relatively to each other in the separating direction. As shown, the plunger has a flange 15 which abuts against a shoulder 16 formed by the lower edge of the bushing 12 (Fig. 2).

In filling the pen illustrated, the cap 13 is unscrewed from the bushing 12 and the plunger 11 is drawn out from the barrel-extension 10 to its fullest extent and then reciprocated a few times. Each inward movement of the plunger causes a rise of pressure in the space surrounding the collapsible bag 7 and the latter is thereby collapsed (Fig. 1), whereas each outward movement of the plunger again reduces the pressure and allows the bag to expand due to its own inherent tendency (Fig. 2). by this means ink can be drawn into the barrel 1, as will be understood. No valve-controlled opening or special vent is necessary between the space surrounding the bag 7 and the outside atmosphere, the fit of the plunger 11 in the bushing 12 being such as to permit some air to pass. This is all that is necessary.

A spring may be provided around the bag to tend to urge the plunger outwardly and other modifications may also be made; for example, the breathing or choke channel may be formed through the body of the plug 3. Also, packing means may be provided on the plunger, if desired.

It is to be understood that ink may also pass into the bag 7 during the filling of the pen, after the barrel 1 itself has been filled.

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. Self-filling fountain pen of the type specified, comprising a barrel which itself constitutes the whole or the principal part of the ink reservoir, an extension of the barrel containing the collapsible bag, a longitudinal air tube opening into the bag at the end thereof which is adjacent to the barrel and into the barrel at the end thereof which receives the feed section, and a member telescopically engaged with the extension so as to enclose the bag and adapted by its displacement for collapsing and expanding the bag by pneumatic action and without contact therewith.

2. Self-filling fountain pen according to claim 1, wherein the displaceable member has the form of a plunger cylinder adapted to telescope inside the extension and over the collapsible bag.

3. Self-filling fountain pen according to claim 2, wherein the displaceable member is connected to a cap-member adapted for being screwed to the extension for securing the said member in its normal position.

4. Self-filling fountain pen according to claim 1, 2 or 3, wherein the extension and displaceable member are provided with interengageable flange, shoulder or like stop-means for limiting the relative displacement thereof.

5. Self-filling fountain pen according to claim 3 or 4, wherein the displaceable member is guided in an externally threaded bushing which is screwed into the upper end of the extension from which it projects to receive an internally threaded cap secured upon the upper end of the displaceable member.

6. The self-filling fountain pen of the type specified, constructed, arranged and adapted for operation substantially as described with reference to the accompanying drawing.

Dated this 13th day of May, 1937.
For the Applicants,
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[This Drawing is a reproduction of the Original on a reduced scale.]

FIG. 1.

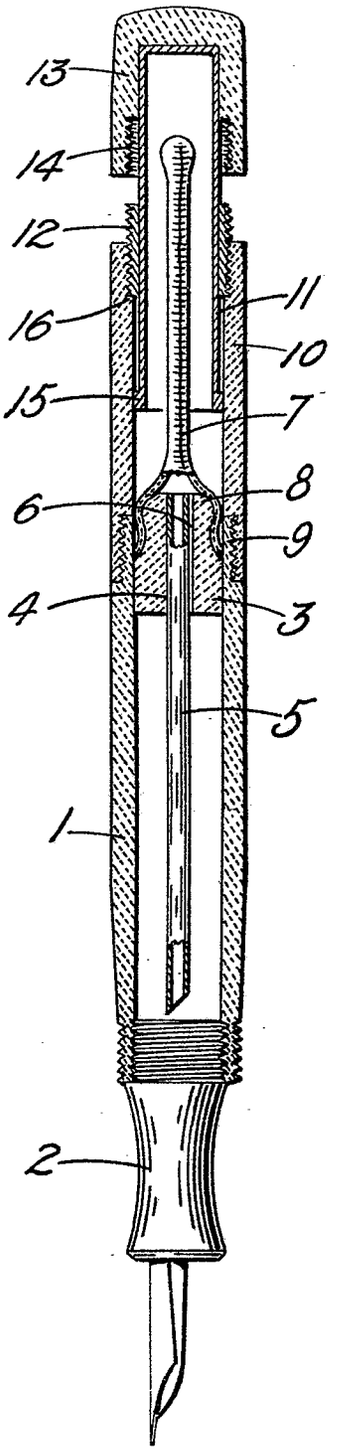
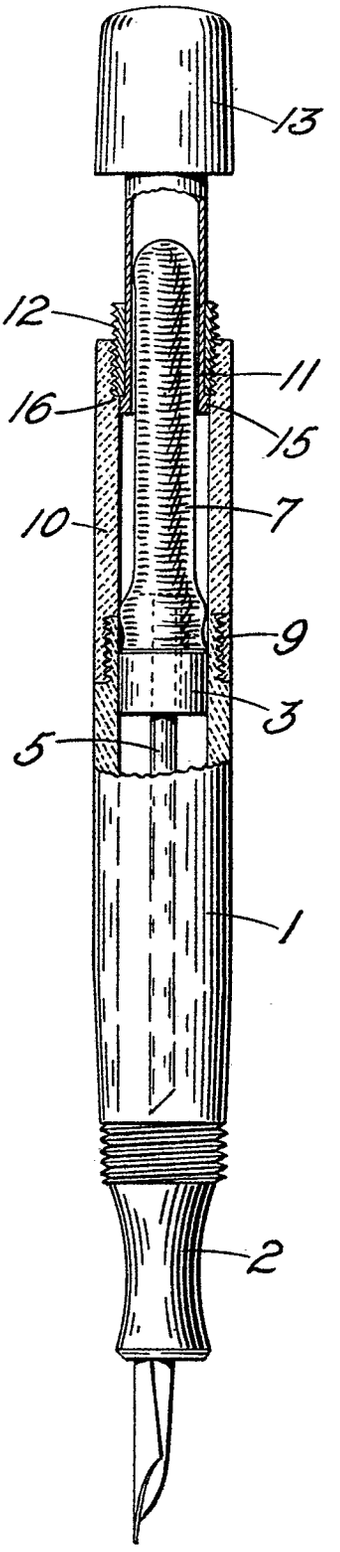


FIG. 2.



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