

## PATENT SPECIFICATION



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### PROVISIONAL SPECIFICATION

#### Improvements in or relating to Self-filling Fountain Pens

We, THE SPOT PEN COMPANY LIMITED, formerly known as Mentmore Manufacturing Company 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:—

The present invention concerns improvements in or relating to self-filling fountain pens of the type (hereinafter referred to as the type specified) in which there is a collapsible sac for the reception of the ink and in which the sac is, for filling, collapsed by a pressure member which is operated from a stud longitudinally movable in the upper end of the pen.

In pens of the type specified it is customary to fix one end of a flexible steel bar at the lower end of the pen, the bar extending up within and close to the wall of the pen barrel to the upper end of the barrel where it is cranked and connected to the inner end of a stud that is movable longitudinally of the barrel. The outer end of the stud can be pressed to move the stud inwardly and cause curvature of the flexible bar to press upon and collapse the sac. Usually the pressure on the sac is actually exerted by a straight pressure-bar that is attached to the flexible bar about the place where it bends most towards the sac. In order to prevent inadvertant operation of the stud it is normally covered by a cap which screws on to the end of the barrel and is removed when it is desired to fill the pen.

One disadvantage of this type of pen is that the lower end of the pressure-bar is apt to wear the ink sac and ultimately pierce it, several different pressure bars have been tried in attempts to avoid this disadvantage. It is to be observed that this trouble is more liable to occur if the assembly of the parts is incorrect and this is especially apt to occur with cheap pens; the assembler cannot see what he is doing if the barrel is, as usual, opaque.

Another disadvantage is that there is

liability to damage the nib in filling owing to the fact that considerable longitudinal pressure has to be put on the stud whilst the nib is in the ink in order to produce a pumping action.

The main object of the present invention is to provide an improved sac-collapsing device suitable for a pen of the type specified and one which shall, to a large extent at all events, obviate the disadvantages mentioned.

One feature of the invention is in a pen of the type specified a sac-collapsing device comprising a flexible steel bar, and an element movable longitudinally of the barrel in an outward direction to effect collapse of the sac.

Another feature of the invention is in a pen of the type specified a sac-collapsing device comprising a flexible steel bar, an element movable longitudinally of the barrel to bend the said bar, a cap on the top of the barrel, and means to move the said element longitudinally of the barrel on removal or unscrewing of the said cap.

The invention will become more fully apparent to those skilled in the art from the following description of one construction of pen illustrative of the invention.

The illustrative pen comprises a barrel having at one end (the lower end) a nib section to which is attached an ink sac in usual manner, the sac extending nearly to the top of the barrel. The top end of the barrel is reduced in diameter to form a neck which is threaded externally and is provided with a central bore. In the central bore is fitted a stud having a head inside the barrel to limit its outward movement. To the outer end of the stud is rotatably attached a cap piece which is internally threaded to screw on to the thread of the neck; thus the cap is permanently attached to the pen.

Attached to the internal head of the stud is the upper end of a steel holding bar which adjacent the stud is cranked so that most of its length lies along the interior wall of the barrel. The lower end of the holding bar is floating, that is, it is not fixed to the nib section, and it has an aperture through which passes

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the reduced lower end of a flat flexible steel bar; the margins of this aperture engage with the shoulders formed at the junction of the reduced portion with the body of the flexible bar. The upper end of the flexible bar is formed as a short round rod which passes through an aperture in the cranked portion of the holding bar and overlaps the stud. The upper end of the round rod abuts against the lower end of the neck of the barrel. Rockably attached to the middle of the flexible bar is a long pressure-bar adapted to press on the ink sac when the flexible bar is flexed.

The operation is as follows:—When the pen is to be filled the cap is unscrewed relatively to the neck; the cover can be made so that when completely unscrewed it can continue to turn without longitudinal movement. This unscrewing of the cap draws the stud outwardly and consequently draws the holding bar in the same direction. As the lower end of the flexible bar is attached to the lower end of the holding bar, the movement of the latter also moves the lower end of the flexible bar upwardly; consequently, the upper end of the flexible bar being longitudinally fixed by its abutment against the neck of the barrel, the flexible bar is bent into an arc and the pressure bar moves transversely of the barrel to collapse the sac. The pen is dipped into the ink and the cap screwed on to the

neck and the various bars are restored to normal position, thus releasing the sac so that it can fill with ink.

This device is simply and cheaply constructed; the filling operation does not involve any longitudinal (downward) pressure by the operator on the stud since the longitudinal movement of the latter is effected by the rotary movement of the cap and thus the nib is not liable to be forced against the bottom of the ink bottle; the collapsing of the sac is effected by an outward movement of the stud instead of an inward movement as is usual; during the collapsing of the sac the pressure bar is moved slightly away from the nib section so that its lower end is less liable to puncture the sac; the stud cover is permanently attached to the pen so that it cannot be lost as happens with usual pens.

In an alternative the cap is not attached to the stud so that unscrewing of the cap does not draw the stud outwardly; this movement is effected by a spring located between the top of the barrel neck and the head of the stud. Inward movement of the stud is effected by screwing on the cap.

Dated this 22nd day of July, 1935.

For the Applicants:

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## COMPLETE SPECIFICATION

### Improvements in or relating to Self-filling Fountain Pens

We, THE SPOT PEN COMPANY 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:—

The present invention concerns improvements in or relating to self-filling fountain pens of the type (hereinafter referred to as the type specified) in which there is a collapsible sac for the reception of the ink and in which the sac is, for filling, collapsed by a pressure member which is operated from a stud or like part longitudinally movable in the upper end of the pen.

In pens of the type specified it is customary to fix one end of a flexible steel bar at the lower end of the pen, the

bar extending up within and close to the wall of the pen barrel to the upper end of the barrel where it is cranked and connected to the inner end of a stud that is movable longitudinally of the barrel. The outer end of the stud can be pressed to move the stud inwardly and cause curvature of the flexible bar to press upon and collapse the sac. It has also been proposed that a screw-device should be provided to serve the aforesaid function of the stud. Usually the pressure on the sac is actually exerted by a straight pressure-bar that is attached to the flexible bar about the place where it bends most towards the sac.

One disadvantage of this type of pen is that the lower end of the pressure-bar is apt to wear the ink sac and ultimately pierce it; several different pressure-bars have been tried in attempts to avoid this disadvantage. It is to be observed that this trouble is more liable to occur if the assembly of the parts is incorrect and this is especially apt to occur with cheap pens;

the assembler cannot see what he is doing if the barrel is, as usual, opaque. Another disadvantage, particularly with a stud, is that there is a danger of damaging the nib, when filling the pen, owing to the tendency to press the pen downwardly.

For a pen of the type specified, a sac-collapsing device has already been proposed comprising a flexible bar, an element extending longitudinally within the pen-barrel and movable longitudinally away from the nib-section for effecting collapse of the sac by bending the said bar, and a button movable in a slot in the cylindrical face of the pen and operatively connected to the aforesaid element for moving the same. With this arrangement, there would be a danger of collapsing the sac by inadvertent movement of the button.

According to the present invention, in a pen of the type specified, a sac-collapsing device comprises a flexible bar, an element extending longitudinally within the pen-barrel and movable longitudinally away from the nib-section for effecting collapse of the sac by bending the said bar, and screw-means operative upon the said element for moving the same.

Preferably a screw-cap on the top of the barrel is directly operative upon the longitudinally movable element in such manner that collapse of the sac is produced by the action of unscrewing the said cap.

The invention will become more fully apparent to those skilled in the art from the following description, by reference to the accompanying drawing, of one construction of pen illustrative of the invention. In the drawing:—

Fig. 1 is a longitudinal section of the barrel of the pen, showing the sac dilated, Fig. 2 a similar view, showing the sac collapsed, and

Fig. 3 a perspective view of the bar assembly.

The illustrative pen comprises a barrel 1 which, at the lower end carries a nib section (not shown) to which is attached an ink sac 2 in usual manner, the sac extending nearly to the top of the barrel. The top end of the barrel is reduced in diameter to form a neck 3 which is threaded externally and is provided with a central bore 4. In the central bore is fitted a stud 5 having a head 6 inside the barrel to limit its outward movement and a head 7 at its outer end to which is rotatably attached a cap piece 8 which is internally threaded to screw on to the neck 3; thus the cap is permanently attached to the pen. The stud 5 may

conveniently be made in two parts which are screwed together, as illustrated in Fig. 1. The cap 8 may also be made in two parts, the stud-head 7 being imprisoned in a recess in the cap-body by a screw-plug 9.

Attached to the lower end of the stud 5 is the upper end 10 of a steel holding bar 11. As illustrated the said upper end 10 of the bar 11 is bent to a U-section and wedged into the open lower end of the stud 5. The bar 11 is cranked adjacent to the stud so that most of its length lies along the interior wall of the barrel 1 (Figs. 1 and 2). The lower end of the bar 11 is floating, that is, it is not fixed to the nib section, and it has an aperture 12 through which passes the reduced lower end 13 (Fig. 3) of a flat flexible steel bar 14, the shoulders 15 of the reduced end engaging the margins of the said aperture. The upper end 16 of the flexible bar 14 is bent to a U-section or is formed as a short round rod which passes through an aperture 17 in the cranked portion of the holding bar 11 and, overlapping the stud-head 6, abuts against the inside of the end of the barrel. Clipped or pivoted to the middle of the flexible bar 14 is a long pressure-bar 18 adapted to press on the ink sac 2 when the said flexible bar is flexed.

The operation is as follows:—When the pen is to be filled, the cap 8 is unscrewed two or three turns relatively to the neck 3, such unscrewing being limited by the abutment of the head 6 against the inside of the end of the barrel 1. If desired, the cap can be made so that, when completely unscrewed, it can continue to turn without longitudinal movement. The unscrewing of the cap 8 draws the stud 5 outwardly and consequently draws the bar 11 in the same direction. As the lower end of the flexible bar 14 is engaged by the lower end of the bar 11, the movement of the latter also moves the lower end of the flexible bar upwardly. Consequently, as the upper end of the flexible bar is longitudinally fixed by its abutment against the inside of the end of the barrel 1, the said flexible bar is bent into an arc and the pressure-bar 18 moves transversely of the barrel to collapse the sac 2 (Fig. 2). The pen is dipped into the ink, the cap 8 is screwed back on the neck, and the various bars are restored to their normal positions (Fig. 1), thus releasing the sac 2 so that it becomes filled with ink.

This device is simply and cheaply constructed; the filling operation does not involve any longitudinal pressure by the operator on the stud 5 since the longitudinal movement of the latter is effected

by the rotary movement of the cap 8 and the nib is thus not liable to be forced against the bottom of the ink bottle; the collapsing of the sac 2 is effected by an outward movement of the stud instead of an inward movement as is usual; during the collapsing of the sac the pressure bar 18 is moved slightly away from the nib section so that its lower end is less liable to puncture the sac; the cap covering the stud is permanently attached to the pen so that it cannot be lost as happens with usual pens.

In an alternative arrangement, the cap 8 is not attached to the stud 5, so that unscrewing of the cap does not positively draw the stud outwardly. Outward movement is effected by a compression spring located between the end of the barrel-neck 3 and the head 7 of the stud. Inward movement of the stud is effected by screwing down the cap.

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. In a pen of the type specified, a sac-collapsing device comprising a flexible bar, an element extending longitudinally within the pen-barrel and movable longitudinally away from the nib-section for effecting collapse of the sac by bending the said bar, and screw-means operative upon the said element for moving the same.

2. A pen according to claim 1, wherein

a screw-cap on the top of the barrel is directly operative upon the longitudinally movable element in such manner that collapse of the sac is produced by the action of unscrewing the said cap.

3. A pen according to claim 1, wherein the pressure-bar, during its sac-pressing movement transversely of the barrel, is also moved longitudinally of the barrel away from the nib-section.

4. A pen according to any one of claims 1, 2 and 3, wherein the longitudinally movable element is connected to a non-rotatable stud slidable in the end of the pen-barrel and engaged by the screw-means.

5. A pen according to claim 4, wherein the stud has a head forming a stop within the barrel and a head imprisoned in the screw-means, i.e. the screw-cap in the pen according to claim 2.

6. A pen according to any one of the preceding claims, wherein the lower end of the flexible bar is reduced and engaged in a hole in the longitudinally movable element whilst its upper end abuts against the inside of the upper end of the barrel.

7. A pen of the type specified constructed, arranged and adapted for operation substantially as described with reference to the accompanying drawing.

Dated this 21st day of July, 1936.

For the Applicants:

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

