PATENT SPECIFICATION

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PROVISIONAL SPECIFICATION

Improvements relating to Fountain Pens

I, ERIC ERNEST SAMUEL WADE, of 13, Hope Street, Liverpool, England, a British Subject, do hereby declare the nature of this invention to be as follows:—

This invention has reference to fountain pens, and is concerned especially with an improvement in the screw-on caps with which such pens are fitted for the purpose of enclosing the nib and ink feed when the pen is being carried in the pocket or handbag, or is not in use.

It is customary to include in a pen cap a device usually termed a "shut-off", which consists of a blind cavity to receive the nib and an annular shoulder whose surface is intended to make an air tight joint with the annular end surface of the nib section of the pen.

In some cases the cavity is formed in the cap itself, whilst in other cases it is formed by an inserted piece of material which may be a continuation of the clip-holding member or plug of the cap. In all these cases the material of the shoulder or abutment in the cap is hard, and it will be appreciated that to obtain an air-tight and fluid-tight joint between the hard end surface of the nib-section of the pen and the said shoulder or abutment perfectly accurate construction is essential, as not only must the measurements be such that contact of the surface with the abutment will be ensured but the contacting surfaces must be concentric and lie wholly in transverse planes of the pen which are exactly at right angles to the common axis of the pen and cap in order to contact over their whole areas.

From the remarks in the preceding paragraph it follows that to be efficient shut-off means as heretofore constructed involves a degree of accuracy in manufacture which can be obtained only by the employment of highly skilled labour and at considerable expense.

It is the object of the present invention to provide an improved shut-off for a fountain pen cap which shall be such that an effective seal will be obtained notwithstanding slight inaccuracies in manufacture, which will be inexpensive, and, which can be fitted in the pen caps by average rather than highly skilled labour.

According to the invention a fountain pen cap shut-off comprises a seat for the end surface of the nib section formed of resilient material.

In carrying the invention into practice the shut-off cavity may be constituted by the bore of a hollow member, such as a thimble or sleeve, of appropriate resilient material, as for example india rubber or synthetic rubber, not liable rapidly to become hard or to deteriorate in consequence of the action upon it of ink from the pen, the said hollow member being mounted and suitably retained in position in the cap.

Where an india rubber or equivalent thimble is employed the closed end of the thimble may be adhesively secured to the base of the recess in the cap, in the case of a cap with a solid or permanently closed end, or to the inner surface or end of the removable plug in the end of the cap where such is employed, as, for example, where such a plug secures the pocket clip to the cap.

Alternatively an open-ended rubber or like sleeve may be adhesively secured at its end remote from the open end of the cap to the base and bore of the recess in the cap where the cap has a permanently closed end, or to the removable plug in the end of the cap. In the latter case the plug may be shouldered and the end portion of the sleeve be fitted on and secured to the reduced diameter portion of the plug.

Where the material of the cap or plug permits the rubber thimble or sleeve might be vulcanised to such cap or plug.

Conveniently the exterior peripheral surface, of the shut-off thimble or sleeve may be grooved longitudinally so that its external diameter may yield and accommodate itself to the interior surface of the cap, and thus compensate for any slight variations in the diameter of, or other slight manufacturing inaccuracies in, the bore of the cap, without affecting the interior diameter of the shut-off member.

If desired, the shut-off thimble or sleeve may be merely frictionally retained in

[Price 1/-]

place in the cap, the overall diameter of the shut-off member being such that the member is a relatively tight or force fit in the bore of the cap.

It will be understood that the cylindrical wall of the resilient shut-off member is comparatively thick, and the annular end surface of such member opposing the end surface of the nib section provides a relatively soft seat for the latter surface which ensures an air-tight and ink-tight joint being obtained when the cap is screwed home on the body of the pen.

Dated this 26th day of July, 1938.

O'DONNELL, LIVSEY & CO.,
Chartered Patent Agents,
47, Victoria Street, Westminster, S.W.1,
Agents for Applicant.

COMPLETE SPECIFICATION

Improvements relating to Fountain Pens

I, ERIC ERNEST SAMUEL WADE, of 13, Hope Street, Liverpool, in the County of Lancaster, a British Subject, 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 and has more especial reference to improvements in the screw-on caps with which such pens are fitted for the purpose of enclosing the nib and ink feed when the pen is being carried in the pocket or hand-bag, or is not in use.

It is customary to include in a pen cap a device usually termed a "shut-off", which consists of a blind cavity to receive the nib and which has an annular shoulder or seat intended to make an air-tight and ink-tight joint with the annular end surface of the nib section of the pen when the cap is screwed home.

In some cases the cavity is formed in the cap itself, whilst in other cases it is formed by an inserted piece of material which may be a continuation of the clip-holding member or plug at the top end of the cap. In all these cases the material of the shoulder or abutment in the cap is hard, and it will be appreciated that to obtain an airtight and fluid-tight joint between the hard end surface of the nib-section of the pen and the said shoulder or abutment perfectly accurate construction is essential, as not only must the measurements be such that contact of the surface with the abutment will be ensured but the contacting surfaces must be concentric and lie wholly in transverse planes of the pen which are exactly at right angles to the common axis of the pen and cap and in order to contact over their whole areas. It follows that to be efficient, shut-off means as heretofore constructed involve a degree of accuracy in manufacture which can be obtained only by the employment of highly skilled labour and at considerable expense.

The present invention has for its object to provide an improved shut-off for a fountain pen cap with which an effective seal will be obtained notwithstanding slight inaccuracies in manufacture, which will be inexpensive, and which can be fitted in the pen caps by average rather than highly skilled labour.

According to the present invention, a shut-off for sealing the ink receptacle in a fountain pen having a screw cap, comprises a cylindrical member within the cap adapted to house the projecting portions of the nib and feed, said cylindrical member being of rubber or like resilient material and being furnished at its open or exposed end with a circular seat which —owing to the longitudinal resiliency of the member—is adapted to co-operate with the section-end when the cap is screwed home and to ensure an air-tight and ink-tight joint therewith.

Preferably the shut-off is a unitary, cup-shaped member moulded as one piece from india-rubber or synthetic resilient rubber-like material such as chloroprene with a projecting circumferential spew ring fin or feather edge adapted to engage the inner wall of the cap and thus locate the member in position.

Preferably also, to remove any likelihood of the resilient walls of the shut-off collapsing or becoming unduly distorted when the cap is screwed home, an internal cylindrical reinforcing sleeve of thin sheet metal or other suitable material supports and maintains the cylindrical form of the inner walls of the shut-off member, such reinforcement being appropriately shortened so as not to inhibit or deleteriously affect the longitudinal resilience of the member when the cap is screwed home.

The invention will be further described with reference to the accompanying explanatory drawings, which illustrate several embodiments by way of example, and wherein—

Fig. 1 is an elevation partly in section of a fountain pen equipped with a screw cap having a preferred embodiment of resilient shut-off member.

Fig. 2 is a sectional view of another form of screw cap for a similar pen and having an alternative embodiment of resilient shut-off.

Figs. 3 and 4 are respectively a side elevation and end view of the shut-off member illustrated in Fig. 1, and

Fig. 5 illustrates a cheaper form of screw cap and associated shut-off member.

Referring now to the drawings, but first more particularly to Figs. 1, 3 and 4, the body or barrel of the fountain or reservoir pen is generally designated 1, and carries at its front end a nib section 2, from which projects the nib 3 and its associated ink feed, all as customary.

The front end of the barrel 1 adjacent the nib section 2 is externally screw threaded at 4 to mount a screw cap 5 having an internally screw threaded portion 6 adjacent its open end, the cap 5 being closed by a screwed plug 7, which serves also to secure the conventional ring clip 8, although this latter may be omitted as will be understood.

The shut-off member for sealing the ink receptacle of the pen when it is not in use comprises a generally cylindrical member 9 of resilient material such as india-rubber or synthetic rubber-like material, say chloroprene, adapted to house the projecting portions of the nib 3 and ink feed, and being furnished at its open end with a circular seat 10 adapted to co-operate with the annular end 11 of the section 2 when the cap 5 is screwed home, to ensure an air-tight and ink-tight joint therewith.

In this embodiment the shut-off is a unitary cup-shaped member moulded as one piece with a closed end 12 and having a projecting circumferential fin or feather 13 adapted to engage the inner wall of the cap 5 and thus locate the member in position, while to remove any likelihood of the resilient walls collapsing when the cap is being screwed home, an internal cylindrical reinforcing sleeve 14 of thin sheet metal maintains the cylindrical form of the inner walls of the member 9, such reinforcement being shorter than the member 9 so as not to affect the longitudinal resilience of the latter when the cap 5 is screwed home.

As is shown more clearly in Figs. 3 and 4, the external surfaces of the cylindrical member 9 between the circular seat 10 and the fin or spew ring 13 is milled or formed with longitudinal flutes or corrugations 15, thereby facilitating the axial displacement of the material under compression, while maintaining the general cylindrical form of the sleeve and, in conformity with the general configuration of the cap 5, the closed end portion of the member 9 is tapered down somewhat although if desired the member may be truly cylindrical over its whole length.

In Fig. 1 the cup shaped resilient shut-off member 9 is shown in association with a clip-securing end plug 7, although in Fig. 2 the end plug 7 is shown with an open ended shut-off member 9, there being two sealing surfaces in this embodiment, one 10 co-operating with the annular end 11 of the nib section 2, and the other 17 abutting with the adjacent face of the end plug 7.

In both embodiments the outer cylindrical surface of the shut-off member 9 is of smaller diameter than the internal bore of the cap, the shut-off being located by the fin or spew ring 13 in contact with such bore, it having been found that where such cylindrical surface fits the cap bore even approximately, considerable difficulty is experienced in positioning the shut-off within the cap, and it is for this reason that recourse is had to the fin or spew ring 13 as a locating means, although a moulded projection or projections other than a ring could equally well be used.

In Fig. 2 the shut-off member 9 is also centralised within the cap owing to its end 17 being disposed within a recess 16 formed for the purpose in the plug 7.

If desired, the shut-off member 9 may be secured by adhesive or vulcanised to the end plug 7, although preferably it is left free so as to be readily interchangeable.

In the cheaper form of screw cap illustrated in Fig. 5, which may be moulded in one piece with a closed end 18 and screw thread 6 or may be of tubular material with a plugged end, the shut-off member is of a form generally similar to that illustrated in the preceding Figure 2, but with the reinforcing sleeve omitted, and with a chamfered seating 19 adapted to co-operate with the annular section end of the fountain pen, the reduced body of resilient material adjacent the seating edge locally increasing the flexibility of the sealing member and enabling an ink-tight and air-tight joint to be readily effected on the cap being screwed home notwithstanding the considerable variations in the parts likely to be present under mass production conditions.

It will be understood that the cylindrical wall of the resilient shut-off member 9 is comparatively thick so that while providing a relatively soft seat for the annular end 11 of the nib section 2, the member is adequately robust to maintain its form and ensure an air-tight and ink-

tight joint, preventing leakage when the pen is being carried in the pocket or is otherwise out of use.

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

1. A shut-off for sealing the ink receptacle in a fountain pen having a screw cap, comprising a cylindrical member within the cap adapted to house the projecting portions of the nib and feed, said cylindrical member being of rubber or like resilient material and being furnished at its open or exposed end with a circular seat which—owing to the longitudinal resilience of the member—is adapted to co-operate with the section-end when the cap is screwed home and to ensure an air-tight and ink-tight joint therewith.

2. A shut-off for sealing the ink receptacle in a fountain pen according to claim 1, wherein the shut-off is a unitary cup-shaped member moulded or formed as one piece with a projecting circumferential fin or spew ring adapted to engage the inner wall of the cap and thus locate the member in position.

3. A shut-off for sealing the ink receptacle in a fountain pen having a screw cap according to either of the preceding claims, including an internal cylindrical reinforcing sleeve of thin sheet metal preventing the shut-off collapsing when the cap is screwed home, such reinforcement being shortened so as not to inhibit the longitudinal resilience of the shut-off member.

4. A shut-off member according to any of the preceding claims, having its external surface fluted or corrugated longitudinally, thereby to facilitate the flow of the resilient material under compression when the cap is screwed home.

5. A shut-off member according to any of the preceding claims having its closed and/or inner end in abutment with the end plug or other wall closing the end of the screw cap.

6. A shut-off member for sealing the ink receptacle in a fountain pen having a screw cap according to any of the preceding claims, wherein the cylindrical walls of the member are freely disposed within the bore of the cap, whereby the member may be readilly inserted and when positioned is enabled freely to contract and expand in a longitudinal direction as the cap is screwed and unscrewed.

7. A shut-off member for sealing the ink receptacle in a fountain pen according to any of the preceding claims, having its inner end seated within a central recess formed for the purpose in the end plug of the cap and serving to centralise the shut-off member.

8. A shut-off for sealing the ink receptacle in a fountain pen having a screw cap, constructed and arranged for use substantially as described with reference to the accompanying drawings.

Dated this 26th day of July, 1939.
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FIG. 1.

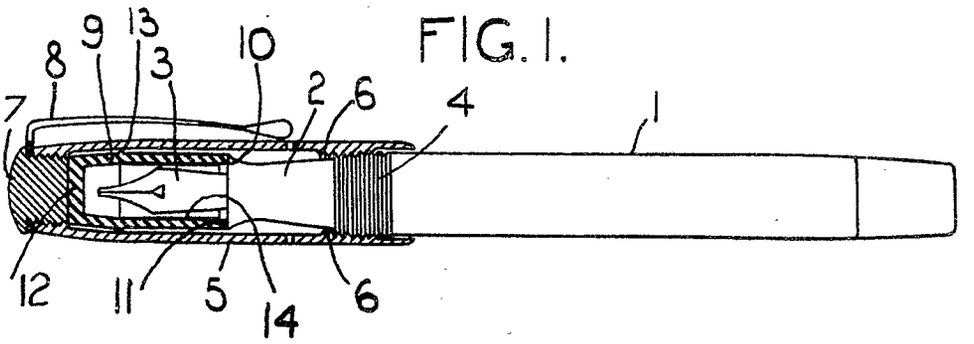


FIG. 2.

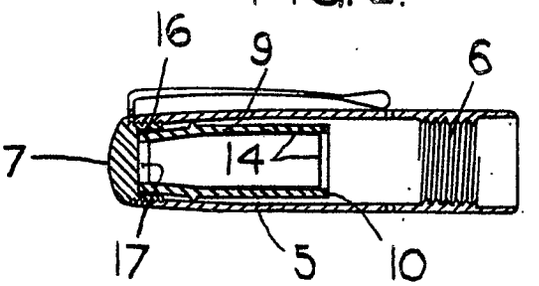


FIG. 3.

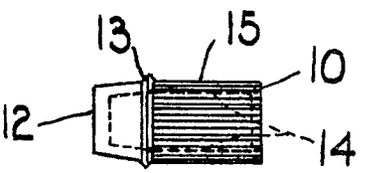


FIG. 4.

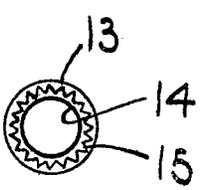
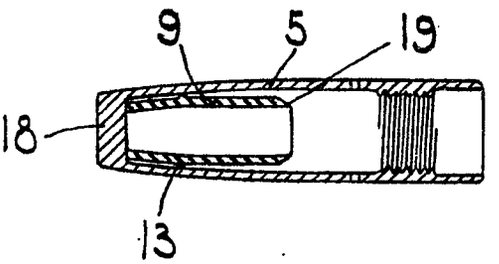


FIG. 5.



[This Drawing is a full-size reproduction of the Original.]

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