PATENT SPECIFICATION

728,188

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COMPLETE SPECIFICATION

Improvements in or relating to Fountain Pens comprising an Ink Cartridge

We, A. J. FAGARD & CIE, a French Body Corporate, of 6, rue Monsigny, Paris (Seine), France, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a fountain pen of the kind comprising a barrel adapted to receive an interchangeable ink cartridge provided with a tapered end having a plug normally closing the cartridge, a nib-section, an ink feed-bar the inner end of which is adapted to force the plug closing the cartridge into the interior thereof, when the cartridge is introduced into the barrel, and a sealing ring of elastic material having an external shape corresponding to the internal-shape of the surrounding barrel and nib-section, adapted to co-operate with the tapered end of the cartridge and prevent the ink contained in the cartridge from escaping and soiling the inside of the pen barrel.

The object of the present invention is to provide a fountain pen of the above kind having an improved sealing ring and means for securing it in the pen.

According to the invention a fountain pen of the kind defined is characterised in that the sealing ring is provided with an exterior flange adapted to be gripped between the nib-section and the barrel of the pen.

According to another feature of the invention said exterior flange includes a front face in the form of a truncated cone which abuts against a corresponding face provided on the nib-section of the penholder, the rear face of said interior flange constituting the bearing and thrust surface for the front end of the barrel of the penholder. The said flange is disposed adjacent the front end (i.e. towards the pen nib) of the sealing ring.

In order that the invention may be readily understood reference will be made to the accompanying drawings which illustrate by way of example a preferred embodiment thereof.

In the drawings:—

Fig. 1 is a partial view in longitudinal section of a fountain pen furnished with the sealing ring according to the invention before the cartridge has been completely put into place, and

Fig. 2 is a view of the fountain pen when the cartridge has been finally put into place and the pen is ready for use.

In the embodiment represented in the drawings, the penholder comprises a barrel 1 on which is screwed a rear end piece or cap 2 and a nib-section 3. In this nib-section is introduced an ink feed-bar 4 against which the pen nib 5 is held.

The rear end 6 of the feed-bar 4 constitutes a perforating or thrust member for the plug 8 in the end of the cartridge 9. The head 10 of the cartridge has the shape of a truncated-cone. The sealing ring of rubber or like elastic material is designated by reference number 12. In Fig. 1 this ring is shown in the free position before the cartridge has been introduced, and in Fig. 2 this sealing ring is shown in the position it assumes when the pen is ready for use, the cartridge being in place.

The sealing ring includes a face 15 in the shape of a truncated cone which engages a corresponding conical face 16 provided on the nib-section 3. Further, the ring 12 is provided at its end nearest the nib with an internal flange 17 whose length a, in the direction of the fountain pen axis, corresponds to the length of an annular groove provided in the feed-bar 4. A flange 18 provided on the feed-bar 4 constitutes one of the sides of this groove. This flange 18 includes a tapered or conical portion 19 which facilitates assembly of the ring onto the feed-bar 4. The outside diameter d of this sealing ring is

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Price 4s 8d

slightly less than the inside diameter D of the bore at the end of the barrel 1 of the penholder so that a slight clearance 20 exists between this ring and the barrel 1. At its end remote from the nib the sealing ring includes a conical flared portion 21 that substantially corresponds to the shape of the conical head 10 of the cartridge. This flared portion 21 is extended by a small internal flange or lip 22 that is adapted to retain or hold the cartridge in position on the feed-bar 4 when the rear cap 2 is removed for example for verifying the level of the ink in the cartridge.

The rear cap 2 includes a spring 24 which is adapted to urge and maintain the cartridge 5 against the sealing ring 12.

The pen is assembled in the following manner.

The feed-bar 4 and the nib 5 are forced into the nib-section 3 so as to occupy their correct positions. The sealing ring 12 is then slipped over the rear extension 6 of the feed-bar 4 and, by applying a slight pressure the internal flange 17 is introduced into the corresponding annular groove provided in the feed-bar 4; this operation is rendered relatively easy by the provision of the tapered portion 19 and the elasticity of the ring 12. The barrel 1 of the penholder is then screwed on to the nib-section 3 and the end of the barrel is urged against the face 25 of the sealing ring 12 and the external flange of the sealing ring is thereby effectively gripped between the barrel 1 and the nib-section 3. In this way the barrel 1, the nib-section 3, the feed-bar 4, and the sealing ring 12 are held together as one piece. Since rubber (or like elastic or resilient material) is substantially incompressible, the feed-bar 4 is effectively held in the nib-section 3 and, in consequence, in the barrel 1 attached to this section. Hence, in the event of abnormal force being required to pierce open the cartridge the feed-bar 4 is prevented by the sealing ring from being pushed out of the nib-section 3. The portion of the sealing ring adjacent the cartridge is free in the bore at the end of the barrel 1 owing to the clearance 20. Thus when the cartridge 5 is inserted in the barrel 1 in the direction of arrow F (Fig. 1), the rear end 6 of the feed-bar 4 pushes the plug 8 inside the cartridge and the conical portion 10 of the head of this cartridge abuts against the conical portion 21 of the sealing ring 12. Upon inserting the cartridge still more into the barrel 1, the conical head of the cartridge spreads out the deformable sealing ring 12 as shown in Fig. 2 so that the outer face of this ring is urged against the wall of the bore at the end of the barrel 1 and in this way fills up the annular clearance 20 that exists between the sealing ring 12 in its free state and the inner wall of the barrel. The cartridge is forced into the sealing ring until the internal collar or lip 22 of the latter overhangs the rear edge of the conical head of the cartridge and thus grips this head and holds it in place even if the cap 2 of the fountain pen (see Fig. 2) is removed. The spring 24 provided at the end of the bore in the cap 2 serves, when the cap is in position, further to maintain the cartridge in this position in the sealing ring 12.

Thus it is clear that there is obtained a perfect seal between the nib-section 3 and the barrel 1, and between the barrel and the cartridge 9. The ink contained in the cartridge can therefore only flow through the feed-bar 4.

If it is desired to replace the cartridge by another, the end cap 2 is unscrewed and the old cartridge is extracted merely by dislodging its head portion from the lip 22 on the sealing ring 12.

In the device according to the invention any additional member, such as for example a screw threaded ring or collar for fixing or tightening purposes, is dispensed with. A further advantage is that the degree to which the elastic sealing ring is gripped between the various component parts of the fountain pen may be easily adjusted. This adjustment is obtained, on the one hand by varying the amount by which the nib-section 3 is screwed on to the barrel 1, on the other hand, by varying the amount by which the cap 2 is screwed on to the barrel 1, and/or by providing a spring 24 of a suitable strength.

The invention is not limited to the details of construction herein described and illustrated in the accompanying drawing.

What we claim is:—

1. A fountain pen of the kind defined wherein the sealing ring is provided with an exterior flange adapted to be gripped between the nib-section and the barrel of the pen.

2. Fountain pen as claimed in claim 1, wherein said exterior flange includes a front face in the shape of a truncated cone which abuts against a corresponding conical face provided on the nib-section of the penholder, the rear face of said exterior flange constituting the bearing and thrust surface for the front end of the barrel of the penholder.

3. Fountain pen as claimed in claim 2, wherein said exterior flange is situated adjacent that end of the sealing ring, adjacent the fountain pen nib.

4. Fountain pen as claimed in claim 1, wherein the sealing ring includes an interior flange and the feed-bar is provided with a groove having substantially similar dimensions to that by engaging said interior flange in said groove the sealing ring and feed-bar are held together as one piece.

5. Fountain pen as claimed in claim 4, wherein the interior flange of the sealing ring

is located adjacent that end of the sealing ring adjacent the fountain pen nib.

6. Fountain pen as claimed in claim 4, wherein the rear wall (relative to the nib) of the groove provided in the feed-bar is preceded by a tapered portion so that said rear wall is constituted by an exterior flange on the feed-bar the rear face of which flange is tapered.

7. Fountain pen as claimed in claim 1 wherein the end of the sealing ring adapted to receive the tapered end of the cartridge is provided with a small interior flange or lip which is arranged to engage a groove provided behind the tapered end of the cartridge whereby the sealing ring is secured to the latter.

8. Fountain pen as claimed in claim 1, wherein the feed-bar is connected to the nib-section and to the barrel of the penholder, when these members are assembled, by the sealing ring.

9. Fountain pen substantially as herein described and illustrated in the accompanying drawing.

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Fig. 2

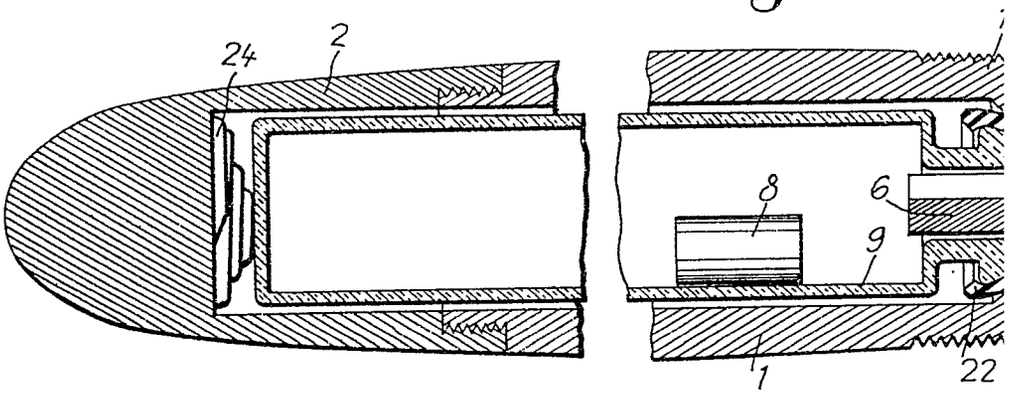
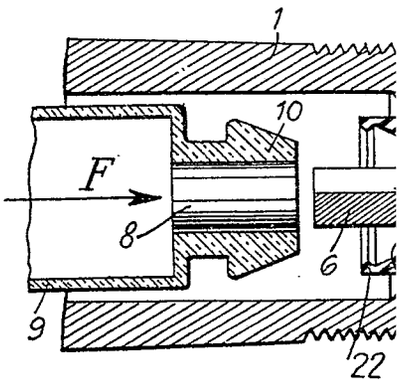


Fig. 1



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This drawing is a reproduction of the Original on a reduced scale.

Fig. 2

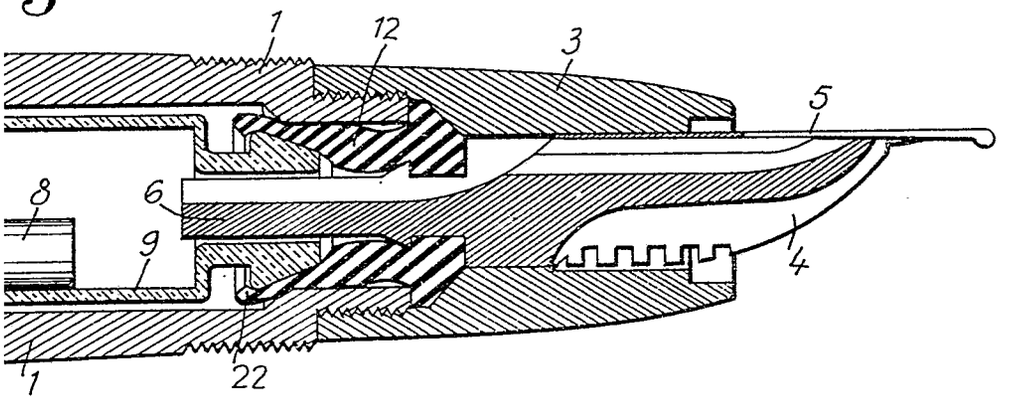

Fig. 1

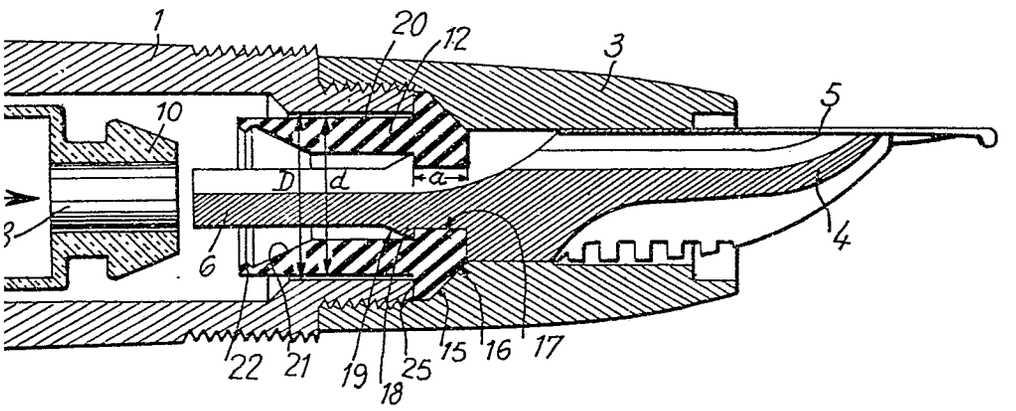

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Fig. 2

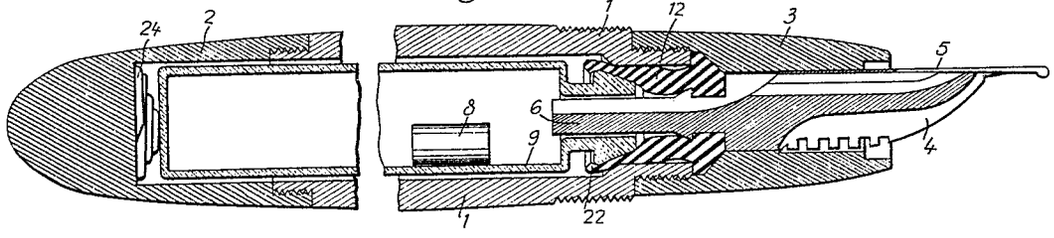

Fig. 1