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## PATENT SPECIFICATION

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### COMPLETE SPECIFICATION

### Improvements in or relating to Fountain Pens

We, AURORA S.P.A., an Italian Body Corporate, of 42 via Arcivescovado, Turin, Italy, 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 present invention relates to a fountain pen in which the charge of ink is contained in a cartridge-type reservoir receptacle which occupies the body of the pen and which at one end is connected to the nib-holder by means of a perforated extension of the nib-holder which projects into the cartridge-type reservoir.

The invention has as its object to provide a pen of this type in which the reservoir containing the ink charge consists of two independent cartridges mounted coaxially in a removable intermediate support occupying a predetermined position in the body of the pen.

In this manner, the pen, while having an ink reservoir in proportion to the capacity of its body, is less exposed to the disadvantages caused by the entry of air into the reservoir, which factor, when the volume is considerable, causes expulsion of ink because of the increase in the air pressure resulting from an increase in temperature.

According to a feature of the invention, each cartridge is closed at one end by means of a perforable diaphragm. The diaphragm of the cartridge adjacent the open end of the body is perforated when the nibholder is screwed into the body of the pen, by the action of the nibholder connection made in the form of a perforator.

According to another feature of the invention the pen is also provided with a means indicating whether the reservoir is complete with its two cartridges or whether the end of the pen remote from the nibholder does not contain a cartridge.

An embodiment of a fountain pen according to the invention is hereinafter described, by way of example, with reference to the accompany-

ing drawings, in which:

Figure 1 is a view of the complete pen, partially in section;

Figure 2 shows, separately, the nib-holder and the ink reservoir;

Figure 3 shows the pen in axial section, with one cartridge only.

In these Figures, 1 represents the nib-holder which is of the usual construction and which has a collar 2, on which is screwed the mouth of a body 3 forming the outer casing of the pen.

At the end of the nib-holder 1 remote from the nib, the conduit for the ink ends in a connecting sleeve 4 with a chamfered cutting edge which perforates the diaphragm 9 of the cartridge projecting from the support in the body when the nib-holder 1 has been screwed into the body 3 of the pen with the ink reserve inside it.

The reservoir for holding the ink reserve consists of two tubular cartridges 5 and 6 which are mounted coaxially in two separate housings in a support in the form of a tubular socket 7 having a central constriction 8 which forms the bottom of each of the two housings. Each of the cartridge 5, 6 has, at the end intended to be outside the tubular support socket 7, the thin diaphragm 9, which is preferably made integral with the body of the cartridge, and on which the connecting sleeve 4 of the nib-holder acts to make the perforation necessary for bringing the inside of the cartridge into communication with the conduit for the ink in the nib-holder 1.

The ink reservoir is represented by the two cartridges 5 and 6 engaged, as shown more clearly in Figure 2, in the support socket 7. These cartridges may conveniently be made of a suitable synthetic plastic material and have sufficient mechanical strength to prevent crushing, whereas the mechanical strength of the diaphragm 9 is reduced to permit its perforation by the action of the connecting sleeve 4 of the nib 1.

When it is desired to fill the pen, all that is

(Price 3s.)

Price 75p

Price 25p

Price 4s Price 33p

necessary is to separate the nib-holder 1 of the pen from the body 3 and insert in the latter the reservoir consisting of the two cartridges as shown in Figure 2.

5 The two cartridges and their common support socket 7 take up a given position inside the body 3, said position being determined by projections 10 inside the body 3 near the end remote from the nib.

10 When the reservoir is housed inside the body 3 and the mouth of the latter is screwed on to the collar 2 of the nib-holder 1, of the pen, the diaphragm 9 of the cartridge 5 is perforated, as a result of which the interior of said cartridge

15 5, full of ink, comes into communication with the ink conduit in the nib-holder 1. This state of the newly filled pen is shown in Figure 1.

20 As shown in this Figure, a small space is left empty at the end of the body 3 and is occupied by a chain 11 attached to the body 1 and provided with a small ball 12. When the reservoir is complete, the chain is confined in this small empty space and the small ball is not free to move.

25 When the cartridge 5 is exhausted, the nib-holder 1 is separated from the body 3 of the pen, and the interior reservoir formed by the cartridges 5 and 6 mounted in the support socket 7 is removed from said body. Then,

30 when the empty cartridge 5 has been detached, the support socket 7 is re-introduced into the body of the pen with the single cartridge 6 in the reverse position, that is to say with its diaphragm 9 against the mouth of the body 3.

35 In these circumstances the reservoir assembly is shorter than before but the position which the support socket 7 occupies in the body 3 is still the same, in view of the fact that the edge of the support socket 7 rests against the stops

40 10, and that it is held there when the collar 2 is screwed into the mouth of the body 3. In this operation, the connecting sleeve 4 perforates the diaphragm 9 in the cartridge 6 and the pen is in the state shown in Figure 3 of the

45 drawing.

The empty space at the end of the body 3 of the pen is now considerably larger than that shown in Figure 1, as a result of which the chain 11, is extended under the action of the weight of the ball 12, and forms a tiny clapper which, when the pen is moved, strikes against the body 3 thus indicating that the pen now only contains one ink-reserve cartridge.

As a result of the construction described, a

very simple pen is produced in which substantially the whole capacity of the body is used to contain ink and the latter is divided between two easily replaceable cartridges which can be inserted and exchanged simply by opening the pen. 55

What we claim is:— 60

1. A fountain pen wherein the body of the pen, detachably connected at one end to the nib-holder, contains inside it a charge of ink divided between two independent tubular cartridges mounted coaxially in a removable support socket, occupying a predetermined position in the body of the pen, said support socket consisting of a holder which the cartridges partially penetrate from opposite sides. 65 70

2. A fountain pen as claimed in claim 1 wherein each cartridge has at one end a perforable diaphragm which can be cut by a connecting sleeve with which the nib-holder is provided. 75

3. A fountain pen as claimed in claim 2, wherein the perforable diaphragm is made in one piece with the body of the cartridge.

4. A fountain pen as claimed in claim 2 or claim 3 wherein the connecting sleeve on the nib-holder has a chamfered cutting edge. 80

5. A fountain pen as claimed in any of claims 1 to 4, wherein inside the body, near the end remote from the nib, there is provided a stop for one edge of the support in which the two cartridges engage. 85

6. A fountain pen as claimed in any of claims 1 to 5, wherein inside of the body of the pen, at the extremity remote from the nib-holder, a member is provided, which is substantially stationary when the pen contains both cartridges and is movable, when the adjacent cartridge is absent, to indicate the absence of said cartridge. 90

7. A fountain pen as claimed in claim 6, wherein said member comprises a small ball attached by means of a chain to the end of the body. 95

8. A fountain pen having an ink charge in a cartridge-type reservoir and substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings. 100

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

Fig. 1

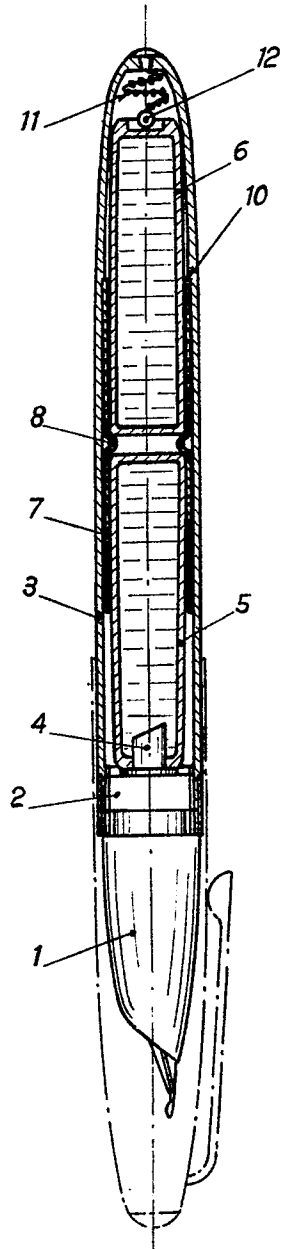


Fig. 2

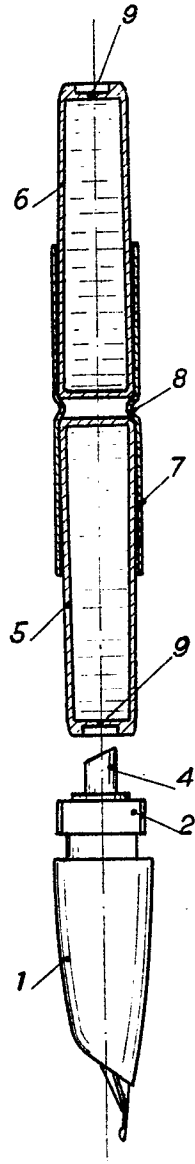


Fig. 3

