

PATENT SPECIFICATION



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COMPLETE SPECIFICATION.

Improvements in and relating to Fountain Pens.

I, LOUIS BADOIS, of No. 212, Boulevard Pereire, Paris, France, of French nationality, 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 of the type which have a movable member operated by a screw thread adapted to open or close all communication between the ink reservoir and the nib.

The object of the invention is to provide a fountain pen capable of being used with any kind of ink (fixed black ink, copying ink *etc.*) of being carried in any position, of being instantaneously opened and closed, of being always ready for use, and having a perfectly regular feed of ink to the nib.

It has been proposed to provide the ink reservoir of a fountain pen with a valve-like head adapted to register with a seat on the movable member which surrounds the ink reservoir for nearly its whole length, and is screwed thereto at the closed end, a small annular space being formed at the head of the reservoir between it and the movable member, and circular grooves being provided in the outside of the reservoir between it and the movable member for making an ink-tight joint.

It has also been proposed to flatten the feed bar of a fountain pen more or less as may be required, either for the extreme length of the bar or only for a certain portion thereof.

The present invention consists of a fountain pen having all the passages through which the ink flows capillary comprising a movable member attached at one end to the open end of the reservoir by means of a screw thread, a feed

regulating device fixed to the other end of said movable member, a hollow spindle fixed at one end to the reservoir and having the other end closed and provided with a conical seat adapted to register with a corresponding seat on the feed regulating device, a narrow annular space extending practically the whole length of the hollow spindle formed between the outside wall of said hollow spindle and the inside wall of said movable member, and a cap containing a device in contact with the end of the nib for automatically ensuring the starting of the ink supply on the removal of the cap.

In the accompanying drawings which illustrate by way of example one mode of construction of a fountain pen according to the present invention.

Figure 1 is a view in elevation of the fountain pen when closed,

Figure 2 is a longitudinal section corresponding to Figure 1.

Figure 3 is a view in elevation of the fountain pen when open,

Figure 4 is an elevation of the feed regulating device with which the fountain pen is provided, and,

Figure 5 is a section of the same device along the line V—V of Figure 4.

The same reference letters show the same parts in the various figures of the drawings.

The improved fountain pen may comprise the following elements:

A hollow member for holding ink and having a special shape as shown in Figs. 1 and 2 of the drawing, that is a projecting portion 1 the outside surface of which is cylindrical and a portion 2 the outside surface of which is conical. The said member is provided with an inside shoulder 3 which supports the base 4 of a hollow spindle 5 attached to the said

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member. The said spindle is provided along one of its generating lines with a longitudinal slot 6 which stops a little before the conical head 7 of the said spindle, and which allows the ink contained in the capacity 8 of the member 1—2, to pass outside the hollow spindle. Obviously, any kind of orifice suitably arranged, placing in communication the inside with the outside of the spindle, could be used for the same purpose.

The inner surface of the portion 1 is provided with a screwthread 9 which engages with the screw-threaded end 10 of a member 11, the other end 12 of which carries the nib 13 and the feeding device 14. The member 11 is provided with a conical seat 15 on which the head 7 of the spindle can be applied. From the said seat up to its screwthreaded end 10 the member 11 has an inside diameter slightly greater than the outside diameter of the body 5 of the spindle, in such a manner as to form at 16 an annular space having a small or capillary thickness. The said capillary space is constantly filled with ink owing to the existence of the slot 6 above mentioned; the said ink passes into the feed-regulating device 14 when the head 7 of the spindle is slightly removed from its seat and its flow can in fact be adjusted by the said movement and is completely stopped when the head of the spindle rests on its seat. The relative motion of the spindle relatively to its seat is obtained by means of the screwthreads 9 and 10, by rotating the two members 1—2 and 11 relatively to each other.

4) It is to be noted that the capillary action is interrupted between the ink reservoir 8 and the nib, because the spindle rests directly on the feed-regulating device without leaving any space other than capillary whatever may be its position; in this manner when the spindle is open the capillary action of the feed-regulating device, the conical shaped spindle, and the annular space 16 all being of the same size act together and on the other hand when the spindle is closed the whole of the ink in the reservoir is isolated from the nib.

The mode of closing by means of a spindle above described, combined with the ink distributor 16 consisting of a capillary annular cylindrical surface allows on one hand the fountain pen to be carried in all positions without any leakage being possible, and on the other hand, in view of the phenomena of capillarity, it allows of regulating the feed

and more particularly of reducing the size of the drop of ink when the fountain pen is almost emptied.

A tight-joint fit should be provided between the two parts 1—11 which are screwed on each other; this result may be obtained by one of the following means, used either separately or combined.

The said parts may be provided with a screwthread on a great length, notches being provided at intervals or, as shown in Fig. 2, the surfaces which are opposite to each other may be smooth and circular grooves similar to those used in pistons of steam engines such as 17, 18 provided in one of the surfaces, in the portion 11 for instance. This is an effective way of obtaining a tight joint fit. It is also possible to fill the circular groove which is nearest to the free end 19 of the part 1 with a pasty material insoluble in alcohol, or to form a rubber joint at 20; the nearer is the spindle to its closing position, the more is the joint pressed. Any other known jointing means such as leather joints, stuffing box, etc. may be used.

The feed regulating device 14 above mentioned forms an important part of the fountain pen according to the present invention. It has been studied and constructed in such a manner as to combine its capillary action with that of the cylindrical regulator 16 in order that the ink shall be retained in the best manner possible, whilst ensuring the presence of a large quantity of ink in the capillary conduits; moreover, reserve recesses ensure a certain elasticity in the flow of the ink. The said recesses could if desired be suppressed.

As shown in detail in Figs. 4 and 5 of the drawing the feed regulating device is provided with a narrow channel 21 allowing the ink to be brought to the end of the nib and a channel 22 of small depth forming a cup with a rounded bottom the edges of which rest on the nib, the said channel having for its object to allow the air to penetrate to the reservoir when the ink contained in the feed regulating device has been almost exhausted whilst retaining the ink by capillarity when the latter for any reason fills the feed regulating device entirely. The channel 22 may be provided as shown in Fig. 5 on a portion only of the length of the feed regulating device, but it can also be provided on the entire length of the nib. The form of the channel 22 which only covers a part of the width and

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of the length of the feed regulating device gives a very regular feed.

The back end 23 of the feed regulating device has the shape of a cone fitting exactly the spindle in such a manner as to leave a space of uniform thickness between the feed regulating device and the spindle.

The device according to the present invention comprises also an automatic starting device the principle of which has been suggested by that movement which consists in wiping the end of the nib on a piece of cloth when the nib does not write.

The device in question allows the end of the nib to be rubbed automatically when the cap which covers it, is removed. It may be completed with advantage, although this is not necessary, with a device allowing it to hold a certain quantity of ink in contact with the nib, when the fountain pen is closed without the said ink making any stains on parts of the pen held by the hand when the part or "cap" 24 is operated.

The starting device above mentioned is illustrated in section in Fig. 2 of the accompanying drawings and may be constructed in the following manner, or in any other similar manner:

A projecting member 26 is provided inside the cap 24 and on the bottom of the conical part 25 of the latter, which projecting part acts as a support to a rubber tube 27 which, when the fountain pen is closed, surrounds very exactly, owing to its elasticity, the nib 13. The said tube produces the starting by its suction around the nib when the fountain pen is opened. Moreover, it prevents the ink from being evaporated when in contact with the air, thus avoiding condensation of the evaporated water on that part of the fountain pen which is in contact with the fingers during writing.

The said rubber tube may be combined with advantage with a spongy and supple mass 28 made of rubber for instance, arranged on the bottom of the tube and bearing on the support 26 of the latter and placed in contact with the end of the nib 13 when the fountain pen is closed. The said mass receives thus automatically when the fountain pen is closed a certain quantity of ink which impregnates the nib when the fountain pen is opened, thus ensuring a perfect starting of the nib.

The member 24 is provided on its inner part with a female part which is adapted to receive a male part on the member 11

(the fountain pen is then closed) or the male conical part 2 on the member 1 (the fountain pen is then opened). The cone is chosen in such a manner that the said member shall be fitted on and removed easily without any great effort.

As to the general arrangement of the fountain pen according to the present invention, it should be pointed out the following:

When the fountain pen is closed, it has a perfectly symmetrical shape as shown in Fig. 1. When the fountain pen is opened and the cap 24 25 has been fitted on to the reservoir 12, its shape is still perfectly symmetrical as shown in Fig. 3. This result is obtained owing to the conical parts with which the cylindrical parts 1 and 24 of the reservoir and of the cap are provided.

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 fountain pen of the type hereinbefore referred to, having all the passages through which the ink flows capillary comprising a movable member attached at one end to the open end of the reservoir by means of a screw thread, a feed regulating device fixed to the other end of said movable member, a hollow spindle fixed at one end to the reservoir and having the other end closed and provided with a conical seat adapted to register with a corresponding seat on the feed regulating device, a narrow annular space extending for practically the whole length of the hollow spindle formed between the outside wall of said hollow spindle and the inside wall of said movable member, and a cap containing a device in contact with the end of the nib for automatically ensuring the starting of the ink supply on the removal of the cap.

2. A fountain pen as claimed in Claim 1, in which the hollow spindle has a longitudinal slot which allows the ink to pass to the narrow annular space.

3. A fountain pen as claimed in Claim 2, in which the whole passage from the ink reservoir to the nib is formed by a capillary space, which is adjustable by means of the conical seating between the feed regulating device and the hollow spindle and the capillary passage in the regulating device is formed as a cup with a rounded bottom the edges of which rest against the inside of the nib for its whole length or a portion thereof.

4. A fountain pen as claimed in Claim 1 in which the device for starting the ink supply comprises a tube of elastic material closely surrounding the nib and containing a spongy and supple mass in contact with the nib when the pen is closed so as to retain the ink remaining in the nib and to give it back to the nib on opening the pen.
5. A fountain pen as claimed in Claim 1, in which conical parts are provided at

the ends of the cylindrical parts of the reservoir and of the cap, in order to give to the pen a perfectly symmetrical shape when it is either open or closed.

6. The improved fountain pen substantially as hereinbefore described, and as illustrated in the accompanying drawings.

Dated this 14th day of October, 1920.

MARKS & CLERK.

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

Fig. 1 Fig. 2 Fig. 3

