

## PATENT SPECIFICATION

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## COMPLETE SPECIFICATION

## A Fountain Pen

I, THEODORE KOVACS, of 19, Nottelmannufer, Hannover-Buchholz, Germany, a citizen of Hungary, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a fountain pen comprising a nib and a hollow body inserted in the front part of the barrel and an overflow chamber round this hollow body, the front or nib end of the hollow body hermetically sealing the mouth of the barrel and surrounding both the ink duct leading to the nib and also the air channel leading into the overflow chamber, being an improvement or modification of the invention claimed in the parent patent application No. 15741/51 (Serial No. 713,536).

According to the present invention, the overflow chamber is formed by one or more capillary spaces between the hollow body and the internal surface of the barrel and extending in the longitudinal direction of the barrel, said space or spaces tapering towards the ink reservoir and being of substantially annular cross-sectional shape.

When only one such space is provided, said space is bounded by the external surface of the hollow body and by the internal surface of the barrel.

When two such spaces are provided, according to a further feature of the invention a sleeve is inserted into the front part of the barrel between the hollow body and the barrel, one longitudinally directed capillary space lying between this sleeve and the outer surface of the hollow body, and the other longitudinally directed capillary space lying between the sleeve and the internal surface of the barrel.

The abovementioned arrangement and formation of the overflow chamber greatly simplifies the manufacture of the fountain pen and of the parts forming the overflow chamber, since the hollow body and the sleeves

which may surround it are easily manufactured and inserted in the barrel. The capacity of the overflow chamber may be increased by further longitudinally directed capillary spaces.

Further important features of the invention will appear in the course of the following description with reference to the accompanying drawings which illustrate one embodiment of the invention, chosen by way of example, and in which

Figure 1 is a longitudinal section through the front or nib end of a fountain pen according to the invention, and

Figures 2 to 4 are three cross sections through the front or nib end of the fountain pen, on line II—II, III—III and IV—IV, respectively, of Figure 1.

The bore of the hollow barrel 1 is constricted at its front or nib end. A hollow body 3 with a thickened front part 4 is inserted into the mouth of the barrel, formed by the constriction 2, so as to form a tight closure. The body 3 is provided at its front end with a head part 5 in close contact with the end surface of the barrel. Inside the body 3 is arranged a feed bar 6. A nib 7 lies on the front part of the feed bar. Behind the nib 7 the external diameter of the feed bar is about 0.1 mm, smaller than the internal diameter of the body 3, whereby a cylindrical gap 8 of high capillary is produced which conducts ink from the reservoir 9 to capillary grooves 10 arranged underneath the nib 7. The feed bar and the nib 7 are so mounted in the thickened front part 4 of the casing 3 as to be capable of being withdrawn forwardly.

The body 3 is surrounded by a sleeve 11 which is inserted into the front part of the barrel from the rear and which forms two capillary spaces 12 and 13. At the rear end the body 3 and the sleeve 11 are each provided with an annular flange 14 and 15 respectively. The capillary spacer 12 and 13 taper towards the ink reservoir. They also taper in a transverse direction, towards the nib side of the pen. At the rear end the capillary

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spaces communicate with one another, with the ink reservoir and with the ink duct leading to the nib 7, through narrow gaps 16 which in the wetted state do not let air through.

5 The feed bar 6 is hollow. It is provided at the rear with a relatively wide bore in which is arranged a pin or bolt 17 which forms a third capillary space forming an additional overflow chamber 18 in the bore of the feed bar 6. This chamber 18, like the spaces 12 and 13, tapers towards the ink reservoir and also towards the nib side of the pen. The bolt 17 is provided with four annular flanges. The annular flange 19 at the front end of the pin 17 is a press fit in the bore of the feed bar 6. The annular flange 20 arranged at the rear end of the bolt enables the bolt to be withdrawn in a convenient manner. Slightly below the annular flange 20 is the annular flange 21 which also is a press fit in the bore of the feed bar 6. The annular flange 21 is provided on the nib side with a radial gap 22 extending to the rear end of the bolt and serving as an air inlet opening. Between the annular flanges 19 and 21 is arranged a collar 23 which is provided with a recess 24, which lets air through, on the side remote from the nib. The front end of the bolt 17 is provided with a wide gap 25. In front of the front and surface of the bolt is a front chamber 26 having the shape of a cone, which communicates directly with the outer air through a narrow axial bore 27 in the feed bar 6. A front chamber 28 in front of the front end surface of the sleeve 11 communicates with the axial bore 27 of the feed bar 6 through a wide transverse bore 29 in the body 3 and a coaxial narrow transverse bore 30 in the feed bar 6.

40 During writing, ink flows out of the reservoir 9 through the ink duct 8, 10 directly to the nib 7. Any ink which may be in the overflow chamber 12, 13, 18 has no direct access to the nib and therefore is sucked back through the gaps 16 into the ink reservoir during writing. After the overflow chamber has been emptied, replacement air penetrates through the recess 24 and the gap 22 into the ink reservoir. The collar 23 of the bolt 17 prevents the overflow chamber 18 from being filled up as a result of shaking. Excess ink which as a result of heating or for any other reason passes out of the ink reservoir into the overflow chamber, presses forward until it entirely fills up the capillary spaces 12, 13 and 18 tapering towards the ink reservoir and in the transverse direction towards the nib side of the barrel.

55 The gaps 16 are the sole connection between the spaces 12 and 13 forming the overflow chamber and the ink duct 8. These gaps are so narrow that as a result of their high capillary they are always filled with ink.

60 The transverse bore 29 in the wall of the feed bar 6 is so wide that the capillary action

of the space 12 is completely nullified at this point. For this reason the excess ink advancing forwards in the capillary space 12 will not enter the wide transverse bore 29.

The capillary spaces 12, 13 and 18 forming the overflow chamber are connected with the ink reservoir at their rear ends only, and consequently the excess ink can enter the spaces from the rear only. Since the spaces are narrower at the rear than at the front, the excess ink entering them first fills up the narrower rear portion of the spaces and gradually advances forwards. During writing or when the pen is cooled reduction of pressure takes place in the ink reservoir, and the excess ink in the spaces is sucked rearwardly out of the spaces into the ink reservoir, so long as any ink is present in the reservoir. If the ink reservoir is empty but there is still ink in the spaces 12, 13 and 18, the last remaining excess ink can be used up by passing through the narrow gaps 16 communicating with the ink duct 8 and functioning in the manner of connecting pipes, and then through the ink duct 8, 10.

In this embodiment of the invention, the ink duct leading to the nib is effectively screened off from the overflow chamber, whereby spluttering of the pen when shaken is prevented. The arrangement of the air inlet gap 22 in the bolt 17 mounted in the feed bar which, capable of being within drawn forwardly, also enables the air inlet opening to be cleaned easily. The curved head end 5 at the front of the body 3 can advantageously be used as a seating surface for the closure cap.

What we claim is—

1. The improvement in or modification of the fountain pen claimed in the parent patent application No. 15741/51 (Serial No. 713,536) characterised in that between the hollow body and the barrel there is provided at least one longitudinally directed capillary space for accommodating surplus ink, said space or spaces being of substantially annular cross-sectional shape and tapering towards the ink reservoir.
2. A fountain pen as claimed in claim 1, characterised by a sleeve which is inserted into the front part of the barrel, one of the longitudinally directed capillary spaces lying between this sleeve and the outer surface of the hollow body, and another longitudinally directed capillary space lying between the sleeve and the internal surface of the barrel.
3. A fountain pen as claimed in claim 1 or 2, characterised in that the hollow body is provided with a thickened front part mounted in the mouth of the barrel.
4. A fountain pen as claimed in claim 1, 2 or 3, characterised in that the hollow body is provided with a thickened front part and is inserted into the mouth of the barrel from the front or nib end so that only this head part projects outside the barrel.

5. A fountain pen as claimed in any one of the preceding claims, characterized in that a feed bar arranged in the bore of the hollow body is provided in its front part with a narrow axial bore extending into the front region of the overflow chamber and with a narrow transverse bore communicating with the axial bore, and the hollow body is provided with a wide transverse bore registering with the narrow transverse bore, air being admitted to the overflow chamber through the three last mentioned bores. 30
- 5 6. A fountain pen as claimed in claim 5, characterized in that the rear part of the feed bar is provided with a wide axial bore in which is arranged a bolt or pin which forms in the wide bore of the feed bar an additional overflow chamber. 35
- 10 7. A fountain pen as claimed in any one of claims 2 to 6, characterized in that at their rear ends the capillary spacer forming the overflow chamber and surrounding the hollow body are bounded with respect to the ink reservoir by annular flanges and communicate with the ink reservoir through narrow slots which the wetted state do not let air through. 40
- 15 8. A fountain pen as claimed in claim 7, characterized in that at their rear ends the capillary spacer forming the overflow chamber and surrounding the hollow body communicate with one another and with the ink duct leading to the nib, through narrow slots which in the wetted state do not let air through. 45
9. A fountain pen as claimed in claim 7, characterized in that an annular flange bounding the additional overflow chamber at its rear end is provided with an air inlet opening connecting the additional overflow chamber with the ink reservoir. 50
10. A fountain pen as claimed in claim 9, characterized by a collar which is arranged in the additional overflow chamber and at a short distance in front of the air inlet opening and is provided with a recess, which lets air through, on the side remote from the nib. 55
11. A fountain pen as claimed in claim 9 or 10, characterized in that the air inlet opening between the overflow chamber and the ink reservoir is arranged in the bolt or pin. 50
12. A fountain pen as claimed in any of claims 2 to 11, characterized in that the cross section of the capillary spaces forming the overflow chamber or chambers taper towards the nib side of the barrel. 55
13. The improved fountain pen, substantially as hereinbefore described and as illustrated in the accompanying drawings.

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