

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in Fountain Pens

I, THEODOR KOVACS, of 19, Nottelmann Ufer, Hanover-Buchholz, Germany, German Citizen, 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 furnished at the front end with a nipple provided with an axial bore in capillary communication with the reservoir, and with writing and drawing nozzles, mountable on the nipple, which have a wide rear bore for mounting the nozzle and a narrow bore extending therefrom to the tip of the nozzle in continuation of the axial nipple bore.

In known fountain pens of this kind the rear bore of the nozzles fit the slightly conical or cylindrical nipple; the nozzles are tightly and suction-engenderingly seated. If such a nozzle is pulled off the nipple, ink flows out of the pen into the rear bore of the nozzle as a result of the suction thereon arising, and the nipple itself is also dirtied. The ink dries in the bore of the nozzle and on the nipple and the encrustations hinder the remounting of a nozzle.

The object of the present invention is to guarantee an easy and clean exchange of the nozzles with fountain pens of the above described kind.

An essential feature of the invention consists in the internal diameter of the wide rear bore of the nozzle being considerably larger than the external diameter of the nipple, whereby a wide interval is created between the nipple and the surface of the bore of the nozzle. The nipple contacts only with its end face the base of the wide bore of the nozzle.

On taking off the nozzle therefore no suction occurs; nipple and nozzle are not dirtied. For securing the nozzle, according to a further aspect of the invention, a neck is provided on the front end surface of the pen adjoining and of greater diameter than the

nipple. Appropriately, screw-interconnection is provided for the nozzle and the neck.

The employment of a longitudinally movable cleaning wire arranged in the front portion of the fountain pen and extending through the exchangeable nozzle, has been hitherto considered impractical with fountain pens of the above described kind, considering that a thin wire projecting out of the nipple could be all too easily bent on exchanging the nozzles. Also a cleaning wire projecting out of the nipple makes impossible the employment of differing nozzles, for instance such having a curved writing tube.

In order to enable exchange of nozzles without danger of bending the cleaning wire with fountain pens with a cleaning wire extending through the nozzle, according to a further feature of the invention, the cleaning wire extending through the nipple and nozzle is withdrawable so far that it does not project from the nipple.

Further features of the invention are given in the following description.

A constructional example of a fountain pen with two different nozzles according to the invention is shown in the accompanying drawing, in which:—

Fig. 1 is a longitudinal section of the front portion of a fountain pen with a nozzle for drawing lines, and

Fig. 2 is a longitudinal section of the rear portion thereof.

Fig. 3 is a cross section on the line III-III of Fig. 1.

Fig. 4 is a longitudinal section of the tip portion of a nozzle for stencil writing.

1 is the hollow barrel of the pen. The bore of the barrel is tapered. The rear, narrower portion of the bore forms the reserve space 2. Into the front, wider portion of the bore is screwed a hollow stem 3 screwthreaded at its rear end, the front portion 4 of which fits in the bore of the barrel. The middle portion of the hollow stem is so tapered that, between

[Price 3s. 6d.]

its outer surface 5 and the inner surface of the barrel, a capillary intervening space 6 of annular cross section, adapted to receive and to yield-up excess ink, is provided, which in front is in communication with the atmosphere by an air-inlet opening 7. The hollow stem 3 is provided with a collar 8, which is furnished with a gap 8'. An air passage 9 in the rear end of the hollow stem unites the capillary interspace 6 with the reserve space 2. The interspace 6 tapers towards the reserve space in a hyperbola; in cross section it narrows towards the side of the fountain pen which is uppermost when writing. The hollow stem 3 is provided behind and adjoining its front portion 4 with a wide annular groove 10. The middle portion of the hollow stem presents three longitudinal grooves 11 equally spaced around the periphery, which divide the hyperbolic surface of the hollow stem into three longitudinal lands.

The hollow stem 3 is provided at its front end with a screwthreaded neck 12 and an adjoining nipple 14. The screwthreaded neck is formed with a groove 14. Into the bore of the hollow stem is inserted from the rear a sleeve 15, which has an external diameter about 0.1 mm smaller than the internal diameter of the bore of the hollow stem, whereby between the sleeve 15 and the surface of the bore, a highly capillary intervening space 16 of annular cross section is provided. The sleeve 15 has at its rear end an integral nose 17, which on screwing the hollow stem 3 into the barrel, is clamped between the former and a shoulder in the bore of the barrel, and serves as an abutment for the sleeve. The sleeve extends so far into the bore of the hollow stem, that, between its front conical end face and the conical base of the hollow stem, a highly capillary interspace arises, which forms a continuation of the highly capillary interspace 16. A wedge-and-groove connection (not shown) between the sleeve and the hollow stem, secures the sleeve in position in the hollow stem.

In the rear end of the barrel is screwed a casing 18, which clamps a packing device 19 inserted in the bore of the barrel. In this casing, there is a bush 20, withdrawable rearwardly up to a stop. Such bush is provided with a grip piece 21. In the rear portion of the bush, a plunger 22 is arranged, which is secured against falling-out and bears against a rod 24, extending to the front portion of the barrel and under the influence of a compression spring 23. In the front end of the rod, a flexible cleaning wire 25 is secured.

A nozzle 26, serving for drawing lines, is screwed on to the screwthreaded neck 12. The nipple 13 meets with its front end the base of the hollow head of the nozzle, whereby a reliable, fluid-tight connection is effected between the narrow axial bore of the nipple 65 and the narrow axial bore of the nozzle. The

internal diameter of the hollow head of the nozzle is considerably greater than the external diameter of the nipple. Between the nipple and the inner surface of the head of the nozzle, a wide intervening space 27 is thus provided. The side wall of the hollow head of the nozzle is perforated by wide transverse bores 28.

Two tongues 29, 30 are set in the front portion of the nozzle 26. The tongues, resiliently bearing against each other, provide a channel extending almost to the tip of the tongues, in continuation of the narrow axial bore of the nozzle. The cleaning wire 25 extends almost to the front end of the channel and forms in the narrow bore of the nipple and of the nozzle and in the channel, a highly capillary ink conduit 31, 32, 33.

Fig. 4 shows the front end of a nozzle 26' for stencil writing with an angularly bent writing tube 34. The flexible cleaning wire 25 conforms to the curvature of the writing tube and forms within the writing tube a highly capillary ink conduit 35.

The ink flows through the highly capillary intervening space 16, through its continuation and through the ink conduit 31, 32, 33, to the writing tip. The axial bore in the base of the sleeve 15 is so narrow that with the cleaning wire 25 passed therethrough, it does not permit ink to flow even along the cleaning wire, as a result of which the uniformity of the ink flow cannot be disturbed by movements of the rod 24. The replacement air penetrates through the air-inlet opening 7 into the overflow chamber 6 and after the using-up of any ink contained therein, through the gap 8' and the air passage 9 into the reservoir. The annular groove 10 of the hollow stem 3 prevents the closure of the air-inlet opening 7 by the overflow of ink and permits the venting of the overflow chamber by the longitudinal grooves 11. The hyperbolic profile of the intervening space 6 forming the overflow chamber as well as the narrowing of such intervening space in the transverse direction of the side of the fountain pen uppermost when writing, ensure high uniformity of flow of ink.

The wide intermediate space 27 in the head of the nozzle surrounding the nipple 13 does not permit ascent of ink in the head of the nozzle. The nozzles therefore can be exchanged without dirtying. The transverse bores 28 prevent any suction arising on unscrewing the nozzle. The longitudinal groove 14 of the screwthreaded neck 12 serves for removing dried ink residues, which may remain in the screwthreads from filling. The screwthread on the screwthreaded neck of the hollow stem 3 and the internal screwthread in the heads of the nozzles are so proportioned, that the air passage 9 constantly assumes the same position relatively to the writing surface, when the fountain pen is ap-

plied to the work.

The screwing on and off of the nozzles, particularly those with a curved writing tube or resilient tongues, is not possible without
 5 endangering the thin cleaning wire. In order to guard against damaging the cleaning wire on screwing the nozzles on and off, the bush
 10 20 is drawn back to the stop and with it simultaneously also the rod 24 and the cleaning wire, so far that the front end of the cleaning
 15 wire disappears into the nipple 13. After effected change of nozzle, the bush 20 is thrust back into the casing 18 as far as its grip piece 21 and the cleaning wire into the nozzle. By
 20 pressing on the plunger 22, the cleaning wire moves forward about 1 mm and spreads apart the resilient tongues 29, 30, whereby a dried-up nozzle can be brought to flow again. On releasing the plunger, the cleaning wire is
 25 drawn back under the influence of the compression spring 23, even with nozzles with angularly bent writing tubes. The plunger 22, acting on the rod 24, can also be constructed as a screw stem and used to alter the width
 of stroke with nozzles with resilient tongues.

What I claim is:

1. A fountain pen furnished at the front
 30 end with a nipple provided with an axial bore in capillary communication with the reservoir, and with writing and drawing nozzles, mountable on the nipple, which have a wide rear bore for mounting the nozzle and a narrow bore extending therefrom to the tip of the nozzle in continuation of the axial nipple
 35 bore, in which the internal diameter of the wide rear bore of the nozzle is considerably larger than the external diameter of the nipple, the nipple contacting only with its end face the mounted nozzle with a wide angular
 40 space intervening between the nipple and the surface of the rear bore of the nozzle.

2. A fountain pen as claimed in claim 1, having a neck, for mounting the nozzle, adjoining and of larger diameter than the nipple.

45 3. A fountain pen as claimed in claim 2, formed with a screw interconnection of the neck and nozzle.

50 4. A fountain pen as claimed in claim 3, having a longitudinal groove in the neck.

5. A fountain pen as claimed in any of claims 1 to 4, having transverse bores through the side wall of the bore of the nozzle.

6. A fountain pen as claimed in any of the preceding claims and having a cleaning wire
 55 arranged in the front portion thereof and penetrating the nipple and mounted nozzle, in which the cleaning wire is withdrawable into the nipple.

7. A fountain pen as claimed in claim 6, in
 60 which a rod carrying the cleaning wire is coupled and displaceable relatively to a bush mounted in the rear portion of the pen and withdrawable to a stop.

8. A fountain pen as claimed in claim 7, 65 in which the front end of the rod is guided in a sleeve, inserted in a hollow stem, forming with its outer surface an ink conduit within the hollow stem extending to the axial bore of the nipple. 70

9. A fountain pen as claimed in any of the preceding claims and having a nozzle for drawing lines, in which two tongues, set in the nozzle and resiliently applying themselves against one another, jointly form a channel
 75 in the direction of the axis of the fountain pen.

10. A fountain pen as claimed in any of claims 1 to 8, and having a nozzle with a writing tube, in which the writing tube is
 80 curved.

11. A fountain pen as claimed in claim 3, and having an air passage leading into the reservoir, in which the screwthread of the screwthreaded neck and the internal screw-
 85 thread of the nozzle are so proportioned that the air passage constantly assumes the same position relatively to the writing surface, when then pen is applied for writing.

12. A fountain pen substantially as de- 90 scribed with reference to the accompanying drawing.

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Fig. 1

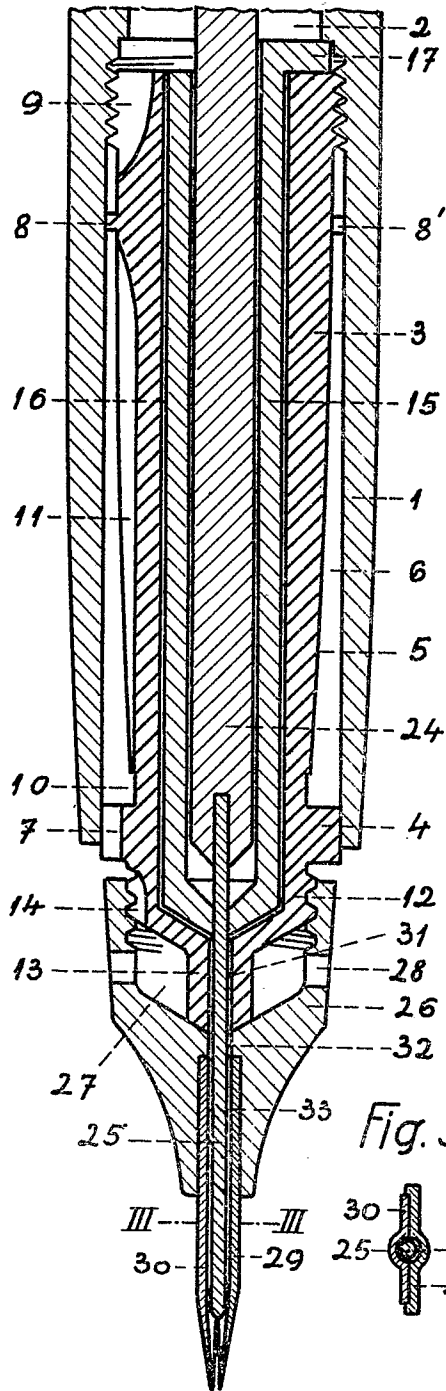


Fig. 2

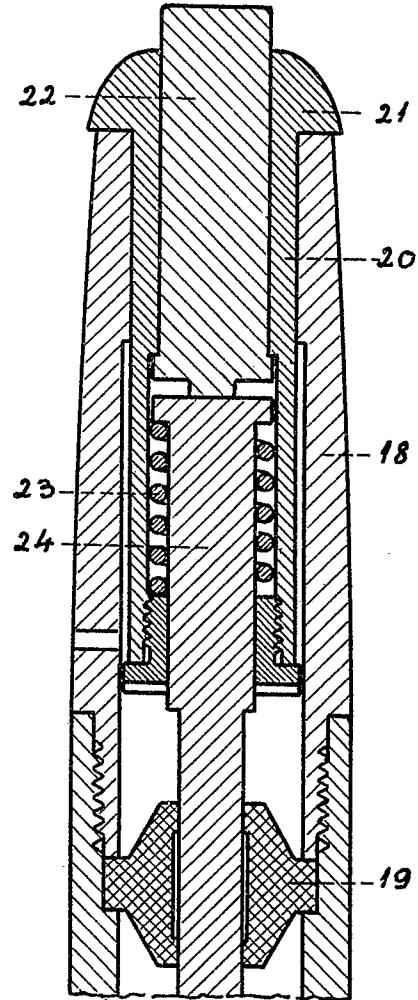


Fig. 4

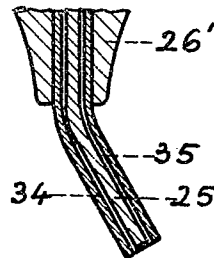


Fig. 3

