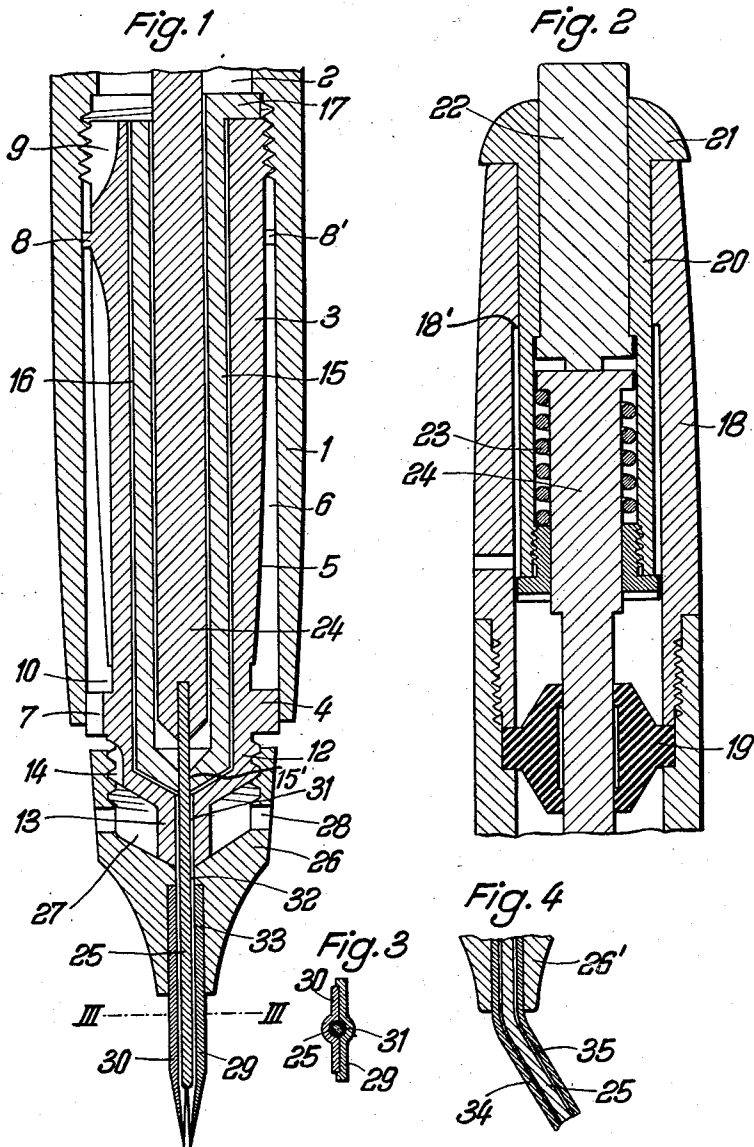


June 23, 1959

T. KOVACS
FOUNTAIN PENS
Filed May 22, 1956

2,891,512



Inventor:

Theodor Kovacs
by *J. H. Smith*
Attorney

1

2,891,512

FOUNTAIN PENS

Theodor Kovács, Hannover-Buchholz, Germany

Application May 22, 1956, Serial No. 586,552

Claims priority, application Germany May 25, 1955

11 Claims. (Cl. 120—42.6)

The present invention relates in general to fountain pens and more particularly to fountain pens having removable nozzles.

In known fountain pens of the type disclosed herein, the rear bore of the nozzle of the fountain pen is fitted on the conical or cylindrically shaped nipple of the fountain pen. The connection between the nozzle and nipple usually is so tight that a suction effect is produced when the nozzle is attached to the nipple. Therefore, when the nozzle is removed from the nipple, ink flows out of the pen into the rear bore of the nozzle. As a result of this flow of ink due to suction the nipple, bore and other parts of the fountain pen are dirtied. The ink on the nipple and in the bore eventually dries and encrustations of ink are formed on the nipple and in the bore.

It is a general object of the present invention to eliminate the above described disadvantages and to provide a fountain pen structure which guarantees an easy and clean exchange of the nozzle.

A further more specific object of the present invention is to provide such a fountain pen structure with a withdrawable cleaning wire.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, 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 rear portion of the bore of the barrel is narrower and forms the ink reservoir 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 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 ink reservoir. The interspace 6 tapers towards the ink reservoir 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 an annular groove 10.

2

The hollow stem 3 is provided at its front end with a screwthreaded neck 12 and an adjoining nipple 13. 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.

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 18'. 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 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 15' 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 consumption of overflow 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 a uniform capillary upward flow of ink.

The 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 neck 12 and nipple 13. 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 applied 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 endangering the thin cleaning wire. In order to guard against damaging the cleaning wire on screwing the nozzles on and off, the bush 20 is drawn back to the stop 18' and with it simultaneously also the rod 24 and the cleaning wire, so far that the front end of the cleaning 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 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 drawn back under the influence of the compression spring 23, even with nozzles with angularly bent writing tubes.

I claim:

1. A fountain pen structure furnished at the front end with a neck portion, said neck portion having a nipple provided with an axial bore in capillary communication with the ink reservoir, and with a tip carrying nozzle mounted on said neck portion, said nozzle having a wide rear bore and a narrow bore extending therefrom to the tip of the nozzle in continuation of the axial nipple 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 annular space intervening between the nipple and the surface of the rear bore of the nozzle.

2. A fountain pen structure as claimed in claim 1, formed with a screw interconnection of the neck and nozzle.

3. A fountain pen structure as claimed in claim 1, having transverse bores through the side wall of the rear bore of the nozzle.

4. A fountain pen structure as claimed in claim 1 and having a cleaning wire arranged in the front portion thereof and penetrating the nipple and mounted nozzle, in which the cleaning wire is withdrawable into the nipple.

5. A fountain pen structure as claimed in claim 1 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 in the direction of the axis of the fountain pen.

6. A fountain pen structure as claimed in claim 1, wherein the nozzle carries a drawing pen.

7. A fountain pen structure as claimed in claim 1, wherein the nozzle carries a writing tube.

8. A fountain pen structure as claimed in claim 7, wherein the writing tube is curved.

9. A fountain pen structure as claimed in claim 4, wherein the cleaning wire is connected to a rod, said rod being coupled by a flexible part to a bushing slidingly mounted in the rear portion of the pen, and a stop arranged in the casing of the pen, said stop engaging said bushing at its "withdrawn"-position.

10. A fountain pen structure as claimed in claim 9, wherein a hollow stem is arranged in the front part of the casing, a sleeve inserted in said hollow stem, forming with its outer surface an ink conduit, within said hollow stem, said ink conduit extending to the axial bore of the nipple, the inner surface of said sleeve serving as a guide for the front end of said rod to which the cleaning wire is connected.

11. A fountain pen structure as claimed in claim 2, and having an air passage leading into the reservoir, in which the screw thread of the screw threaded neck and the internal thread of the nozzle are adapted to each other in such a way, that after screwing home said nozzle, the tip will have a predetermined relative position with respect to the air passage, thereby giving to the air passage a certain relative position with respect to the writing surface when said tip is applied for writing, and that this relative position between air passage and writing surface is the same regardless of the fact which type or size of tip is entered for any occasion of work.

References Cited in the file of this patent

FOREIGN PATENTS

99,102	Germany	Sept. 3, 1898
28,533	Great Britain	Oct. 26, 1905
of 1904		
238,294	Germany	Sept. 21, 1911
705,613	Great Britain	Mar. 17, 1954