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A. N. ANDREWS

2,217,884

FOUNTAIN PEN

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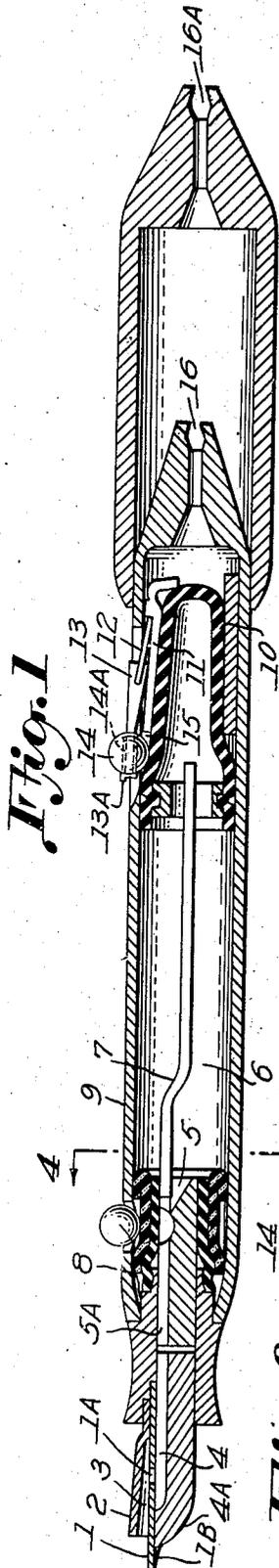


Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

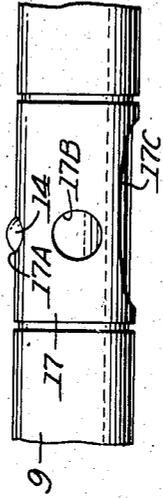
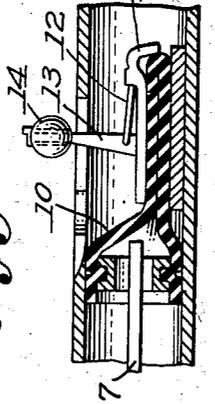
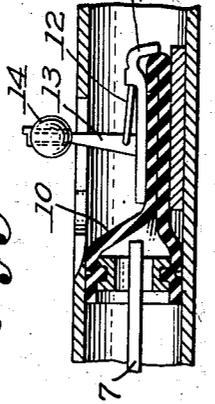
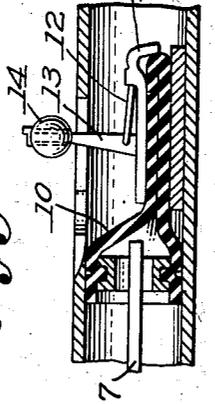
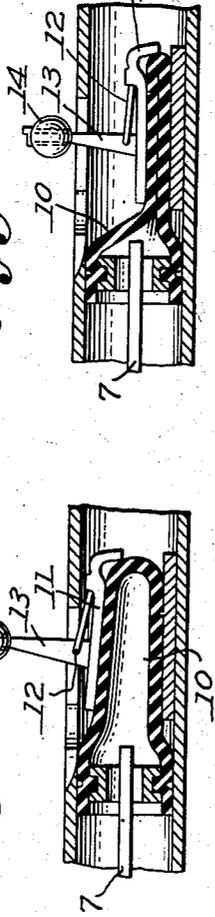


Fig. 6

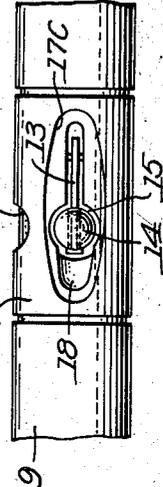


Fig. 7

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UNITED STATES PATENT OFFICE

2,217,884

FOUNTAIN PEN

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Application April 4, 1939, Serial No. 265,898

4 Claims. (Cl. 120—46)

This invention relates to an improved type of a fountain pen provided with an improved starter and filling mechanism adapted to be engaged through the wall of the fountain pen barrel in co-operating relation with the inner resilient wall of the fountain pen ink container and feed channel.

It is an object of this invention to provide a fountain pen wherein a semi-enclosed starter for restricted depression of resilient rubber-like wall of the pen ink container is a relatively small and round press button which has a hole therein, and is engaged through an opening in the side wall of the pen barrel, and is removably securable to container depression unit by medium of said hole provided as mounting for securing member to allow the latter to hold the button in dependent position independently from the casing of the opening in the barrel.

It is also an object of this invention to provide a fountain pen with a container depression unit consisting of a depression bar removably engaged between the pen barrel and resilient rubber-like wall of the pen ink container, and an operating plunger which has one end thereof adapted to secure starting member and provide lifting hold, and which being movably connected with the bar would preserve its normal horizontal position while pressure against the starter may cause the bar to move inwardly,—said plunger normally being loosely disposed in a full-length-fitting slot in the side wall of the pen barrel and movably held in horizontal position by means of an axial connection over the middle portion of the bar the length of said plunger with a relatively long wire-like spring extended horizontally along the outer side of the bar and firmly secured at the end of the bar to the latter and adapted for continuous inwardly pressure against the plunger at the point of said axial connection.

It is furthermore an object of this invention to provide a fountain pen wherein the outer side wall of the pen barrel has rotatably engaged in cylindrically concaved seat therein a relatively wide ring which has a number of circularly arranged and differently sized openings adapted to assume a dependent position over and exposed through the barrel starting and filling members of the container depression unit to initiate different degrees of external exposure of said members thereby allowing to check the scope of manual operation over the starting member, and to shelter the filling member when the latter is not in use.

It is an important object of this invention to provide a fountain pen wherein the ink con-

tainer is walled by a relatively longer end of the pen barrel and compressible rubber-like structure mounted within the other end of the barrel, and engaged by the container depressing member of the starter and filling mechanism, the latter including in the container means to free the container from the air, said means comprising an air pipe similar to ones which often occur in this type of filling mechanisms,—and the holding end of this air pipe is mounted into the inner end of relatively deeper portion of the feed channel in straight line with outer relatively shallower portion thereof to allow direct contact and thereby better cooperating relation of the starter and filling mechanism with said feed channel.

Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawing.

The invention (in a preferred form) is illustrated in the drawing and hereinafter more fully described.

On the drawing:

Figure 1 is a longitudinal sectional view of a fountain pen embodying the principles of this invention.

Figure 2 is a fragmentary view of one end of the fountain pen barrel having an improved container depression unit removably secured thereto and showing starting member secured to a plunger—both in raised position.

Figure 3 is a fragmentary view of the same end of the fountain pen barrel as shown in Figure 2, and showing the rubber-like wall of a hollow bulbous structure of the pen ink container collapsed by means of the operating plunger.

Figure 4 is a fragmentary cross section taken on line 4 of Figure 1.

Figure 5 is the plan of the depression unit.

Figure 6 is a fragmentary elevational view of a side wall of the fountain pen barrel having a relatively wide ring showing number of circularly arranged and differently sized openings therein and a portion of the starting member exposed through one of said openings.

Figure 7 is a fragmentary elevational view of a side wall of the fountain pen barrel illustrated in Figure 6, and showing the same ring exposing through a larger sized opening therein the starting member and plunger of the depression unit.

As shown on the drawing:

The improved fountain pen comprises an elongated hollow barrel 9.

Pushed into the end of the barrel 9 is a pen section 8 wherein in overlapping relation are secured a pen point 1, 1A, 1B, 2 and 3, and a feed 55

bar 4A, the latter consisting of an outer portion removably adjacent (as shown) to the inner portion thereof, and the bar 4A has a feed channel 4, 5A and 5.

The inner portion of the feed bar 4A is provided with an air pipe 7 having one (holding) end thereof mounted into the inner end of relatively deeper portion 5 of the feed channel in straight line with outleading and relatively shallower portion 5A and 4 thereof, and the pipe 7 extends longitudinally through the major portion of the ink container 6 to within a relatively short distance from the closed end of said container, and the latter is walled by the longer end of the barrel 9 and a hollow rubber-like bulbous structure 10.

Removably engaged through a loosely fitting opening 15 in the barrel 9 is a container depression unit comprising a relatively small and round press button 14 having a hole 14A therein, and the button 14 is adapted as starting member, and an operating plunger 13 having one end thereof mounted in the hole 14A and extended through said hole to form a lifting hold 13A, and a depression bar 11 removably engaged between the pen barrel 9 and rubber-like wall of structure 10, and a relatively long wire-like spring 12 firmly secured to the end 11A (Figure 5) of the bar 11, and extended horizontally along the outer side of the bar 11 and at the middle portion of the latter forming a connecting axle through plunger 13.

The closed ends of the barrel 9 and pen cap are provided with air holes 16 and 16A respectively (Figure 1). The feed channel 4, 5A and 5 is provided with the air channels 5B (Fig. 4) along its length.

In fragmentary elevational views illustrated in Figures 6 and 7 the outer wall of the pen barrel 9 has rotatably engaged in cylindrically concaved seat therein a relatively wide ring 17 which has a number of circularly arranged and differently sized openings 17A, 17B and 17C of which each may assume a dependent position over starting member 14 and plunger 13 of the depression unit by means of turning manually the ring 17 in its seat in the barrel 9, for instance, from position shown in Figure 6 to position in Figure 7.

Normally the operating lever or plunger 13 is in relatively horizontal position illustrated in Figures 1 and 7 and holds the starting member 14 by means of the hole 14A in normal semi-enclosed position through a loosely fitting opening 15 in the barrel 9 (Figures 1 and 7), or through the same opening 15 covered by a relatively smaller opening 17A (Figure 6) of the ring 17, and in said position the plunger 13 permits the structure 10 (Figure 1) to remain in normally inflated position as shown in Figure 1. Opening 15 in the barrel 9 and certain openings in the ring 17 (openings 17A and 17B, for instance) are smaller than diameter of an average human finger and are adapted to restrict the latter's entry into the inner chambers of the pen when the finger presses against the button 14 mounted in said openings.

When it is desired to initiate the start of ink flow in the pen by executing restricted depression of the container, structure 10 may be partially compressed by medium of a finger pressing against the extending portion of button 14 (Figures 1, 6 and 7) in which case due to described construction the compression of structure 10 will be restricted by degree of normally exposed extension of the button 14 over barrel 9 (Figure 1) or ring 17 (Figure 6), and the finger pressure will be restricted by the outer wall of barrel 9 (Figure 1) or ring 17 (Figure 6).

When it is desired to fill the fountain pen the pen point 1, 1A, 1B, 2 and 3 and a small portion of pen section 8 immediately adjacent to the point are projected into a supply of ink.

The ring 17 is turned to allow the relatively larger opening 17C therein to assume position over button 14 and plunger 13 (Figure 7) thereby fully exposing said members, then the plunger 13 by means of its lifting hold 13A (Figures 1 and 5) is swung outwardly into perpendicular position illustrated in Figure 2.

When in its position shown in Figure 2 the plunger 13 is adapted to be slidably projected inwardly through a slot in the opening 15 to cause the bar 11 to compress or collapse the resilient rubber-like wall of structure 10 as illustrated in Figure 3.

Upon release of the operator's finger from the depressed plunger 13 the wall of structure 10 together with the bar 11 acts to project the plunger 13 outwardly to permit the same to be again manually pushed inwardly to repeat the collapsing operation against the wall of structure 10.

In the pen illustrated in Figure 1 the first collapsing and releasing operations would fill the container 6 only partially as ink quantity entering the container 6 would be proportional to amount of air forced out by collapsing the structure 10, and the latter, as shown, walls only a relatively small portion of said container 6.

While the container 6 is empty the air being forced out may easily escape to outleading portions 5A and 4 of the feed channel directly via portion 5 thereof, but when container 6 is partially filled with ink the latter would block the air from entering said portion 5 of the channel, and the air pipe 7 as long as one end thereof remains above the ink level will provide easier avenue for air to escape to the outleading portions 5A and 4 of the feed channel.

The filling of the illustrated pen is accomplished by repeating described operations against structure 10, each collapsing operation forcing out some air via pipe 7 and portions 5A and 4 of the channel, and each releasing operation bringing in new supplies of ink via portions 4, 5A and 5 of the same channel until ink would cover the pipe 7 and air would cease to escape from container 6.

To decrease number of the operations required to fill the container 6 to its full capacity in co-operation with the pen feed channel the air pipe 7 has its holding end mounted direct into the said channel (the end 5 thereof) in straight line with and to the channel's outleading portions 5A and 4 to allow easier and directly aimed avenue of air escape for greater amounts of air to be forced out with each repeated collapsing operation against structure 10.

Before removing the pen point from the ink supply the lever 13 should be restored to normal position illustrated in Figure 1 by pushing manually the button 14 towards the submerged end of the pen whereby lever 13 will be moved from perpendicular position shown in Figure 2 and by force of spring 12 snapped into position shown in Figure 1. Then, if it is desired to shelter the plunger 13, the ring 17 may be turned from position illustrated in Figure 7 to a new position depending on operator's desire in reference to degree of exposure to be allowed the button 14. If the ring 17 is turned to position illustrated in Figure 6 only relatively small portion of said button 14 will be exposed through the relatively smaller opening 17A of ring 17. If

greater exposure of the button 14 is required the ring 17 may be turned to allow opening 17B to assume position over the button 14, and, of course, the ring 17 may be turned to position whereby solid wall thereof—which is between the openings—would cover and shelter the entire depression unit.

Fountain pens embodying described features and when designed for carrying may be equipped for further safety with a shut-off valve, for instance, ball valve 8 (Figure 1) which is constructed within the scope of my U. S. Patent #2,098,528 and, as described therein, will shut off the ink in container 6 when the pen cap is mounted over said valve. Thus, if the starter and filling structure are accidentally compressed while the pen is in carrying position, the ink will not leak out from said container.

While specific embodiments of this invention are herein shown and described, it is and will be clearly understood, of course, that variations within the scope of accompanying claims may be resorted to without jeopardizing this patent protection, and that the various details of construction may be varied through a wide range without departing from the principles of this invention as described in one or more of the following claims, and is therefore not the purpose to limit the patent granted hereon otherwise than necessitated by the said scope of the appended claims.

I claim as my invention:

1. A fountain pen comprising an elongated barrel, a section in one end of the barrel, a pen point and feed bar secured in the section, an opening in the side wall of the barrel, an ink container within the barrel sealed from said opening by a resilient and rubber-like wall of the container, a starter and filling mechanism having a depression unit removably engaged in the barrel against the wall of the container, a relatively small and round press button which has a hole therein and is normally held in semi-enclosed position through said opening in the barrel independently from the casing of said opening, and is removably securable to depression unit by medium of said hole in the button, which hole is provided as mounting for securing member to allow the latter in cooperating relation with the inner wall of the pen barrel to hold the button in dependent position.

2. A fountain pen comprising an elongated barrel, a section in one end of the barrel, a pen point and feed bar secured in the section, an

opening in the side wall of the barrel, an ink container within the barrel sealed from said opening by resilient rubber-like wall of the container, a starter and filling mechanism including a container depression unit removably engaged in the barrel against the resilient wall of the container and having a starter and filling member exposed through the opening in the barrel, and a relatively wide ring which is rotatably engaged over the opening in the barrel in cylindrically concaved seat in the outer side wall of the barrel and has a number of circularly arranged and differently sized openings adapted to assume a dependent position over the starter and filling member of the depression unit, and one opening in the ring is relatively larger than the opening in the barrel, and another opening in the ring is relatively smaller than the opening in the barrel.

3. A fountain pen comprising an elongated barrel, a section in one end of the barrel, a pen point and feed bar secured in the section, an ink container within the barrel, a starter and filling structure comprising a combination of a container depressor secured and engaged in the other end of the barrel, a feed channel from the container to the pen point in the feed bar, and the bottom of said channel has no passages therein leading to an air pipe, an air pipe which has one end thereof secured between walls of the feed channel above the bottom of the latter, and the pipe is extended longitudinally within the container towards the container depressor.

4. A fountain pen comprising an elongated barrel, a section in one end of the barrel, a pen point and feed bar secured in the section, an opening in the side wall of the barrel, an ink container within the barrel sealed from said opening by resilient rubber-like wall which is the wall of the container, a container depressing unit removably engaged over resilient rubber-like wall of the container and consisting of a depression bar mounted between the resilient wall of the container and the pen barrel under the opening in the latter, a pivoted operating plunger normally loosely exposed in the opening in the barrel and pivotally secured and held in dependent position over the bar by means of a relatively long U shaped wire-like spring which has its upper ends secured to the bar and is extended longitudinally towards the middle section of the bar where the lower end of the spring is in axial connection with the plunger.

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