

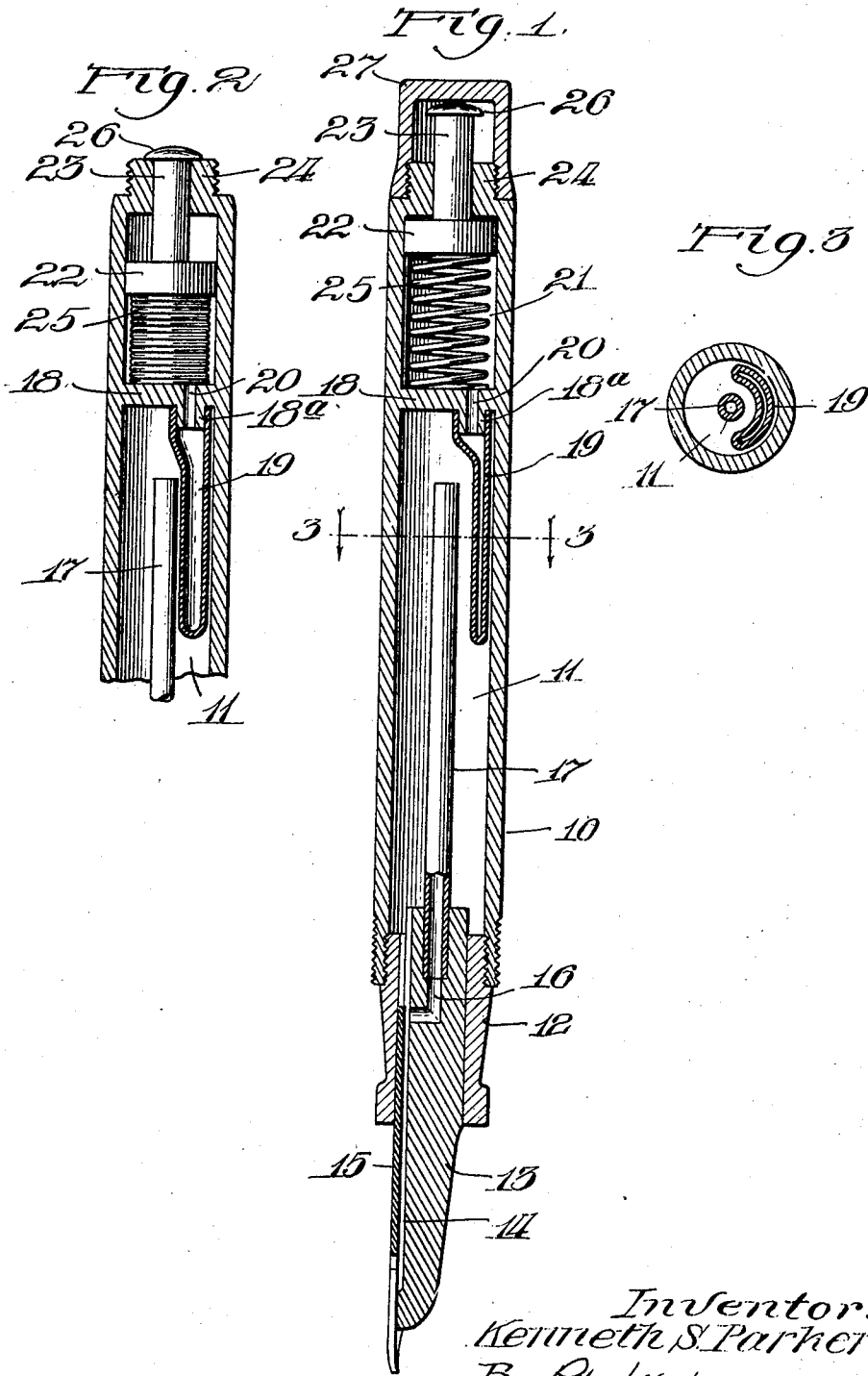
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K. S. PARKER

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FILLING MECHANISM FOR FOUNTAIN PENS

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Inventor:
Kenneth S. Parker
By *Retro, H. H. Davis & Macaulay*
Attys

UNITED STATES PATENT OFFICE

KENNETH S. PARKER, OF JANESVILLE, WISCONSIN, ASSIGNOR TO THE PARKER PEN COMPANY, OF JANESVILLE, WISCONSIN, A CORPORATION OF WISCONSIN

FILLING MECHANISM FOR FOUNTAIN PENS

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My invention relates generally to fountain pens and has to do more particularly with filling mechanism for so-called sacless pens wherein the pen barrel may provide the ink reservoir.

One of the objects of my invention is to provide an improved quick-fill mechanism for a pen of the foregoing general character which is simple and inexpensive and which may be readily and easily operated by one hand to accomplish filling of the pen.

Another object is to provide a filling mechanism which includes a spring-operated piston device for operating an air-displacement device located within the ink reservoir, the piston device having a part accessible for filling operations.

Additional objects are to provide an air-displacement device in the form of a bulb, or the like, which is expanded and contracted by and as the piston device is reciprocated to alternately expel air from the reservoir and draw ink thereinto; and to provide an arrangement wherein a very few strokes of the piston device results in filling of the pen.

Other objects and advantages will become apparent as this description progresses and by reference to the drawings wherein,—

Figure 1 is a vertical sectional view of one form of pen embodying my invention, and showing the filling mechanism in a normal non-filling condition with the displacement bulb collapsed;

Fig. 2 is a sectional view of the upper part of the pen showing the displacement bulb expanded; and

Fig. 3 is a horizontal section taken substantially on line 3—3 of Fig. 1.

The form of pen which I have chosen to illustrate my invention comprises a barrel providing an ink reservoir 11. The lower end of the barrel is threaded to receive a pen-section nozzle 12 which supports a feed bar 13 having the usual feed channel 14 beneath the pen point 15. This feed bar is provided with an L-shaped passage 16, one end of which opens into the reservoir 11 and the other end connects with the feed channel 14 intermediate the ends of the latter. A tube 17 is mounted in the feed bar passage 16, and

this tube extends toward and near the rear end of the pen. The upper or inner end of the reservoir 11 is formed by a partition piece 18 which will be referred to more particularly hereinafter. Filling of the reservoir 11 is accomplished by displacement of the air therein followed by the drawing in of ink through the feed channel 14 and tube 17. More particularly, due to the relative cross-sectional areas of the passage in the tube 17 and the feed channel 14, and the relative fluidity of the air and ink, air will be forced out through the tube 17, together, probably, with a relatively small amount of ink, if there is any ink in the barrel, when an air-displacement action takes place within the ink reservoir. Of course, as will be well understood, when the ink reservoir is restored to its normal condition, ink will be drawn into the reservoir through the feed channel 14 and tube 17.

My invention has to do, particularly, with means for successively effecting the foregoing displacement action in the ink reservoir. More specifically, I employ within the ink reservoir, and at one side of the tube 17, a normally collapsed bulb 19 formed, preferably, of a desirable flexible material, such as rubber, and which is so formed as to normally retain its collapsed condition. Displacement of the air in the reservoir through the tube 17 is accomplished by expanding the bulb 19, and, to effect a relatively great displacement, the bulb normally takes a semi-circular shape extending a substantial distance around the reservoir wall. It is to be understood, however, that I do not desire to be limited to the particular size and dimensions of the bulb shown because the same may be varied without departing from my invention.

The bulb is supported in suspended position within the reservoir by means of the partition piece 18. As shown in the drawings, this partition piece is formed integrally with the barrel wall, but not necessarily so since it is obvious that the piece 18 may be a separate disc-like part fixed in position within the barrel in any desired manner. This piece is provided near its edge, at one side of

the tube 17, with a depending nipple 18^a which receives the open end of the bulb 19 and to which the bulb is securely fastened to provide an ink-tight, air-tight connection. 5 The nipple 18^a is provided with an opening 20 which extends through the piece 18 into the piston chamber 21 above such piece.

Successive expanding and contracting of the bulb 19 are accomplished by means of a 10 piston 22 slidably mounted in the chamber 21. This piston has a stem 23 passing axially out through an opening in the rear, reduced-shoulder portion 24 of the pen. This piston is normally held in its outward, or bulb-collapsed position by means of a spring 25. 15 This spring 25 yieldingly opposes the inward movement of the piston 22 and acts to return the piston to its position of Fig. 1 when pressure is released from the piston stem 23.

The outer end of the piston stem is provided with a rounded head 26 which may be readily and comfortably engaged by one's 20 finger for inward movement of the piston 22. When the piston 22 is so moved inwardly, compressing the air in the chamber 21 ahead of it, the bulb 19 is expanded (Fig. 2) thereby displacing air in the ink reservoir as above described. When the pressure of the 25 finger is released from the piston, the spring 25 returns the latter to its non-depressed position thereby withdrawing air from the bulb 19 and collapsing the same. Since the 30 bulb 19 is formed to normally assume a collapsed condition, the foregoing collapsing action will be aided by the inherent ability 35 of the bulb to return to that condition, independently of the piston 22. The piston 22, however, positively insures this collapsing action, making it quite rapid, so that upon a 40 very few strokes of the piston, the pen will be filled.

The reduced shoulder portion 24 at the rear end of the pen is externally threaded to receive an end-closure cap 27 which protects 45 the piston stem 23 against accidental movement which might otherwise result in the ejection of some ink from the feed end of the pen.

While I have shown and described only 50 one form of my invention, it will be understood that other changes in details and arrangements of parts may be made without departing from the spirit and scope of my invention as defined by the claims which 55 follow.

I claim:

1. In a fountain pen having a barrel within which is an ink reservoir and a piston chamber both of which are of constant size 60 and dimension, a normally collapsed bulb device mounted in said reservoir and expansible to displace air in the reservoir and subsequently collapsible to draw ink into the reservoir, the interior of said bulb communicating 65 with said piston chamber, a piston reciprocally mounted in said chamber for expanding

and collapsing said bulb, and spring means opposing movement of said piston in one direction and acting to move the piston in the other direction when pressure is released 70 from the piston for effecting positive predetermined expansion and collapsing movements of said bulb.

2. In a fountain pen having a barrel with an ink reservoir and a separated piston chamber, a normally collapsed bulb device mounted 75 in said reservoir and expansible to displace air in the reservoir and subsequently collapsible to draw ink into the reservoir, a piston slidably mounted in said chamber out of contact with ink in said reservoir and 80 adapted to expand said bulb device when it is moved inwardly, and a spring opposing inward movement of said piston and for returning the piston to its outer position to 85 effect collapsing of the bulb independently of its own collapsing ability.

3. In a fountain pen, a barrel, a partition in said barrel forming an ink reservoir and a separated chamber, said partition having an opening, and filling means including a bulb 90 suspended in said reservoir from said partition so that said chamber is in communication with the interior of said bulb through said opening, a piston device reciprocally mounted 95 in said chamber for effecting expansion and contraction of said bulb, a spring acting on said piston rendering it self-movable away from its bulb-expanding position, and a part 100 on said piston accessible exteriorly of said barrel for effecting reciprocation of said piston.

4. In a fountain pen, a barrel, a partition in said barrel dividing the latter into an ink 105 reservoir and a piston chamber, and filling mechanism including a normally collapsed bulb located in said reservoir, a piston mounted for reciprocation in said chamber, said partition having an opening communicating 110 only said chamber with the interior of said bulb, a spring acting on said piston to oppose movement of the latter in one direction and to move the piston in the opposite direction, and an element accessible exteriorly of 115 said barrel for moving said piston in said one direction against said spring, whereby said bulb may be expanded and collapsed in rapid succession with uniformity in extent of collapsing and expanding.

5. In a fountain pen, the combination of a 120 barrel, a partition forming an ink reservoir in said barrel and a separate chamber, ink feed means carried by said barrel at one end of said reservoir, a tubular member leading from said reservoir to said feed means, a flexible bulb suspended from said partition in 125 said reservoir and being expansible and collapsible to expel air from and draw ink into said reservoir through said tube, said partition having an opening communicating only 130

said chamber with the interior of said bulb, and a spring-actuated piston device in said chamber reciprocable therein to expand and contract said bulb in rapid succession independently of inherent flexibility of said bulb.

In testimony whereof, I have subscribed my name.

KENNETH S. PARKER.

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