July 10, 1934. S. G. YATES ET AL 1,966,369

FOUNTAIN PEN

Filed Feb. 13, 1934

Fig.1.

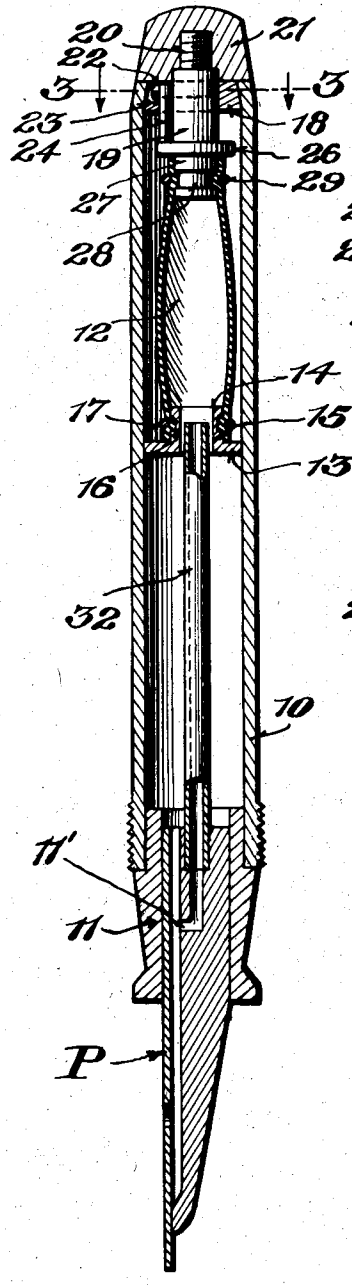


Fig.2.

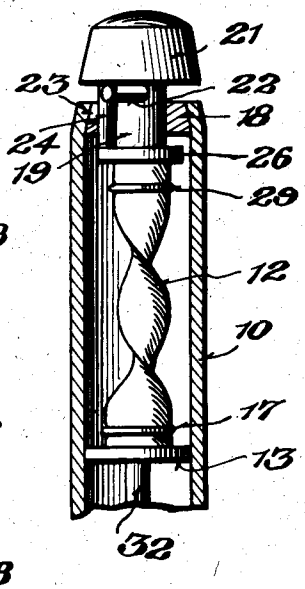


Fig.3.

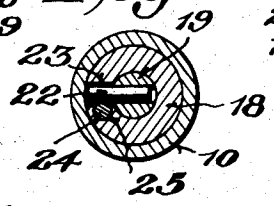


Fig.4.

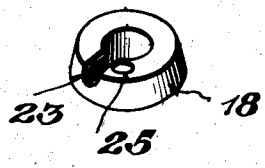


Fig.5.

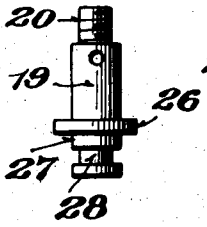


Fig.6.

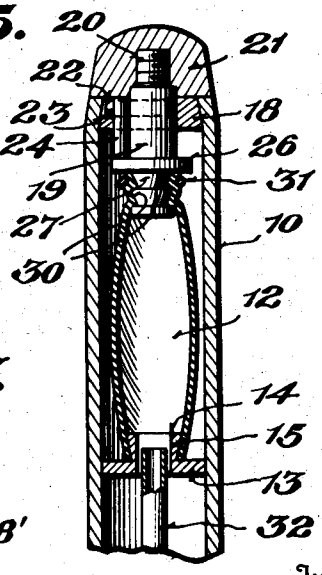
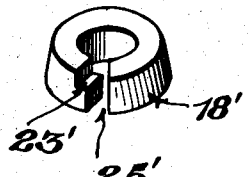


Fig.7.



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Patented July 10, 1934 1,966,369

UNITED STATES PATENT OFFICE

1,966,369

FOUNTAIN PEN

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Application February 13, 1934, Serial No. 711,036

14 Claims. (Cl. 120—46)

This invention relates to fountain pens and has special reference to that type of fountain pen wherein a flexible rubber filling sack is employed, which sack is normally expanded and which is collapsed by a twisting of the sack as the initial step in filling the pen.

One important object of the invention is to provide an improved construction for effecting twisting of the sack by rotating the upper end of the sack.

A second important object of the invention is to provide a novel arrangement of stop member for the rotatable part of the pen whereby such stop member is normally housed in a stop slot so as to prevent accidental rotation of the rotatable part and thus to eliminate accidental ejection of the ink.

A third important object of the invention is to provide a novel arrangement of stop pin coacting with the rotatable stop member and housed when the stop member is housed but protracted into the path of the stop member when the latter is moved out of housed position.

With the above and other objects in view the invention consists in general of certain novel details of construction and combinations of parts hereinafter fully described, illustrated in the accompanying drawing and specifically claimed.

In the accompanying drawing like characters of reference indicate like parts in the several views, and:—

Figure 1 is a view with the barrel and certain upper parts in section on a plane passing diametrically through the barrel and the remainder in side elevation, the filler sack being shown in fully expanded condition.

Figure 2 is a view similar to the upper part of Figure 1 but with the sack twisted to collapsed position.

Figure 3 is a section on the line 3—3 of Figure 1.

Figure 4 is a perspective view of a certain retaining washer used in this pen.

Figure 5 is a side elevation of the upper sack terminal and its stud.

Figure 6 is a view similar to the upper part of Figure 1 but illustrating a second form of said terminal.

Figure 7 is a perspective view showing a second form of the washer shown in Figure 4.

The pen, constructed in accordance with this invention, is provided with the usual cylindrical barrel 10 into which is secured at its lower end the pen holding member 11 carrying the pen P. Inasmuch as the present invention does not affect the construction of this pen holder member this member is here shown as a typical embodiment of any such part and it is not deemed necessary to describe the details thereof since such parts are old and well known.

In the upper part of the barrel there is provided a tubular soft rubber filler sack 12. The material of which this sack is made has sufficient resiliency and its wall is of sufficient thickness for the sack to normally hold the expanded position shown in Figures 1 and 6. However, if one end of the sack be held stationary and the other end twisted it may be collapsed as shown in Figure 2 thus expelling the air from the sack and displacing a certain amount of fluid from the pen.

A diaphragm 13 is fixed across the barrel at about the middle of its length and has a centrally disposed boss 14 projecting from its upper side. A port 15 extends centrally through this diaphragm and boss and the lower end of the sack 12 is fitted on the boss 14. In the form of the invention shown in Figure 1 the boss 14 is provided with a circumferential groove 16. In order to hold the sack 12 firmly to the boss a portion of the sack is forced into the groove 16 by means of a band or ring 17 of metal, twine or any other suitable material.

In Figure 6 the boss 14 is provided with an inverted frusto-conical exterior and the lower end of the sack 12 is held on the boss by the natural resiliency of the material of which the sack is composed, the sack being also cemented on the boss to more securely hold it in place.

At the upper end of the barrel there is fixed a retaining washer 18 which has a centrally disposed opening wherein is rotatably and slidably mounted a stud 19. The upper end of this stud is reduced and threaded as at 20 and on this upper end is screwed an operating head 21 which is recessed in its lower surface so that the upper end of the stud body 19 may fit in said recess. A cross-pin or stop member 22 is fitted transversely of the stud body and has one end projecting radially therefrom. This cross-pin normally rests in a radial groove or notch 23 formed in the upper face of the washer 18, the cross-pin being thus normally housed in the washer. A longitudinally disposed stop pin 24 is fitted for sliding movement in a hole or opening 25 formed in the washer parallel to its axis and adjacent the notch 23. On the lower end of the stud body there is provided a flange 26 which is normally spaced below the washer 18. The lower end of the stop pin 24 rests on the flange 26 and, in normal position, the upper end of said pin is flush with the upper face of the washer 18.

With this arrangement the stud normally in retracted position may be moved upwardly into protracted position. When thus moved the cross-pin 22 is lifted out of the notch 23 so that the stud may be rotated. At the same time, the flange 26 causes the stop pin 24 to be protracted above the washer 18 so that, when the stud has been rotated nearly through 360° the cross-pin 22 will engage the stop pin 24 and further rotation of the stud will be prevented. By reason of

both pins being normally housed the head or cap 21 may normally seat flat on the upper face of the washer 18.

Below the flange 26 there is provided a boss 27 on which fits the upper end of the sack 12. In the form shown in Figures 1 and 2 this boss is provided, like the lower boss in these figures, with an annular groove 28 wherein a portion of the sack 12 is forced by a ring or band 29 of the same character as the ring or band 17. In the form shown in Figure 6 the boss is provided with a pair of saw-tooth-like annular grooves 30 into which the upper end of the sack 12 engages by the natural resiliency of the material of which the sack is made. A band 31, similar to the bands 17 and 29, may be used to ensure against detachment of the sack from the boss 27. The sack 12 is of such length that it will normally urge the stud downwardly so as to house the pins and seat the cap or head on the washer 18 but, by reason of its elasticity, the sack will yield when it is desired to lift and rotate the stud.

An air vent tube 32 extends upwardly from the pen holding part 11 and terminates preferably at the middle of the port 15.

As will be seen in Figure 1, the port 15 is of greater diameter than the tube 32 so that an annular passage is formed around that part of the tube 32 which enters the port. Also, the member 11 is provided with a small vent 11' forming an opening for feeding ink to the pen point P.

In Figure 7 there is disclosed a modified form of washer having a body 18' through which extends a radial slit 25' for reception of the pin 24 and, at one side of this slit is a shoulder 23' to receive the pin 22, thus corresponding to the groove 23 of the washer 18.

In operation for filling the stud is lifted and rotated as before described. The part 11 is then dipped in ink and the stud rotated backwards. This first twists the sack and empties it and then allows it to refill. The refilling of the sack produces a partial vacuum within the barrel so that the ink is drawn in.

During the filling operation ink will readily pass from the feed opening 11' up the tube 32 into the sack and, by reason of the location of the upper end of the tube within the bore 15, a strong suction effect is produced as the sack expands. After the sack has fully expanded the ink will flow down the annular passage around the tube into the lower part of the pan and thence through the feed opening 11' to the pen P.

Obviously the barrel may be provided with a transparent wall at its lower part and in such case the upper and lower parts of the barrel may be either integral or formed of separate pieces suitably joined together.

There has thus been provided a novel and efficient device of the kind described and for the purpose specified.

It is obvious that changes may be made in the form and construction of the invention without departing from the material principles involved. It is not therefore desired to confine the invention to the exact form herein shown and described but it is desired to include all such as properly come within the scope of the appended claims.

What is claimed, is:—

1. In a fountain pen having a barrel and a filling sack in said barrel; operating means for said filling sack including a washer fixed in the upper end of the barrel and having a slot in its upper face extending from the washer opening outwardly, a stud connected to the upper end of the sack and slidably and rotatably fitted in the washer, an operating cap carried by the upper end of the stud and normally seated on the upper face of said washer, a stop member carried by the stud and normally housed in said slot, said stud being movable upwardly through the washer to free the stop member from the slot and permit rotation of the stud.

2. In a fountain pen having a barrel and a filling sack in said barrel; operating means for said filling sack including a washer fixed in the upper end of the barrel and having a slot in its upper face extending from the washer opening outwardly, a stud connected to the upper end of the sack and slidably and rotatably fitted in the washer, an operating cap carried by the upper end of the stud and normally seated on the upper face of said washer, a stop member carried by the stud and normally housed in said slot, said stud being movable upwardly through the washer to free the stop member from the slot and permit rotation of the stud, and a stop pin slidable through said washer and normally retracted to lie with its upper end flush with the upper face of said washer, said stop pin moving with the stud to project above the washer as the stud is moved upwardly to release the stop member from its slot.

3. In a fountain pen having a barrel and a filling sack in said barrel; operating means for said filling sack including a washer fixed in the upper end of the barrel and having a slot in its upper face extending from the washer opening outwardly, a stud connected to the upper end of the sack and slidably and rotatably fitted in the washer, an operating cap carried by the upper end of the stud and normally seated on the upper face of said washer, a stop member carried by the stud and normally housed in said slot, said stud being movable upwardly through the washer to free the stop member from the slot and permit rotation of the stud, a stop pin slidable through said washer and normally housed therein, and means carried by the stud and engaging the stop pin to cause protraction of the stop pin as the stud is moved upwardly.

4. In a fountain pen having a barrel and a filling sack in said barrel; operating means for said filling sack including a washer fixed in the upper end of the barrel and having a slot in its upper face extending from the washer opening outwardly, a stud connected to the upper end of the sack and slidably and rotatably fitted in the washer, an operating cap carried by the upper end of the stud and normally seated on the upper face of said washer, a stop member carried by the stud and normally housed in said slot, said stud being movable upwardly through the washer to free the stop member from the slot and permit rotation of the stud, said washer having an opening therethrough adjacent said slot, a stop pin slidable in said opening and normally housed with its upper end flush with the upper face of the washer, and a collar on said stud normally spaced below the washer and having the lower end of the stop pin resting on its upper face.

5. In a fountain pen, a barrel, a washer fixed in the upper end of the barrel and having a slot in its upper face extending radially from the washer opening, said washer having a pin hole adjacent one side of said slot, a stud slidably and rotatably fitted in the washer opening, a cross-pin projecting radially from the stud and normally housed in said slot, an operating cap on the upper end of the stud and normally resting on the upper face of the washer, a flange on

said stud normally spaced below said washer, a stop pin in said pin hole resting at its lower end on said flange and having its upper end normally flush with the upper face of said washer, a boss on the lower end of said stud, a rubber filling sack having one end fixed on said boss, and means fixed within the barrel and having the other end of the filling sack fixed thereon.

6. In a fountain pen having a barrel and a filling sack in said barrel; operating means for said filling sack including a washer fixed in the upper end of the barrel and having a slot in its upper face extending from the washer opening outwardly, a stud connected to the upper end of the sack and slidably and rotatably fitted in the washer, a stop member carried by the stud and normally housed in said slot, said stud being movable upwardly through the washer to free the stop member from the slot and permit rotation of the stud, and means for slidably and rotatably moving said stud.

7. In a fountain pen having a barrel and a filling sack in said barrel; operating means for said filling sack including a washer fixed in the upper end of the barrel and having a slot in its upper face extending from the washer opening outwardly, a stud connected to the upper end of the sack and slidably and rotatably fitted in the washer, a stop member carried by the stud and normally housed in said slot, said stud being movable upwardly through the washer to free the stop member from the slot and permit rotation of the stud, a stop pin slidable through said washer and normally retracted to lie with its upper end flush with the upper face of said washer, said stop pin moving with the stud to project above the washer as the stud is moved upwardly to release the stop member from its groove, and means for slidably and rotatably moving said stud.

8. In a fountain pen having a barrel and a filling sack in said barrel; operating means for said filling sack including a washer fixed in the upper end of the barrel and having a slot in its upper face extending from the washer opening outwardly, a stud connected to the upper end of the sack and slidably and rotatably fitted in the washer, a stop member carried by the stud and normally housed in said slot, said stud being movable upwardly through the washer to free the stop member from the slot and permit rotation of the stud, a stop pin slidable through said washer and normally housed therein, means carried by the stud and engaging the stop pin to cause protraction of the stop pin as the stud is moved upwardly, and means for slidably and rotatably moving said stud.

9. In a self filling fountain pen, a barrel, a filler actuating member slidably and rotatably mounted in the upper end of the barrel and urged to retracted position in the barrel, a cap fixed on the upper end of said member and limiting retraction thereof, and means to prevent rotation of the cap upon the member being in retracted position.

10. In a self filling fountain pen, a barrel, a filler actuating member slidably and rotatably mounted in the upper end of the barrel and urged to retracted position in the barrel, a cap fixed on the upper end of said member and limiting retraction thereof, means to prevent rotation of the cap upon the member being in retracted position, and means operable upon protraction of the filler actuating member to limit rotation thereof in its protracted position.

11. In a self filling fountain pen, a barrel, a filler actuating member slidably and rotatably mounted in the upper end of the barrel, means urging said member to retracted position, means on the upper end of the filler actuating member limiting retraction thereof, means to prevent rotation of said filler actuating member in its retracted position, and means operable upon protraction of the filler actuating member limiting rotation of said filler actuating member in its protracted position.

12. In a fountain pen having a barrel and a filling sack in said barrel; operating means for filling said sack including stud-receiving means in the upper end of the barrel provided with a stud opening and having a slot in its upper face extending from the stud opening outwardly, a stud connected to the upper end of the sack and slidably and rotatably fitted in the stud-receiving means, a stop member carried by the stud and normally housed in said slot, said stud being movable upwardly through the stud-receiving means to free the stop member from the slot and permit rotation of the stud, and means for slidably and rotatably moving said stud.

13. In a fountain pen having a barrel and a filling sack in said barrel; operating means for filling said sack including stud-receiving means in the upper end of the barrel provided with a stud opening and having a slot in its upper face extending from the stud opening outwardly, a stud connected to the upper end of the sack and slidably and rotatably fitted in the stud-receiving means, a stop member carried by the stud and normally housed in said slot, said stud being movable upwardly through the stud-receiving means to free the stop member from the slot and permit rotation of the stud, and an operating cap carried by the upper end of the stud for slidably and rotatably moving said stud.

14. In a fountain pen having a barrel and a filling sack in said barrel; operating means for filling said sack including apertured stud-receiving means in the upper end of the barrel provided with a stud opening and having a slot in its upper face extending from the stud opening outwardly, a stud connected to the upper end of the sack and slidably and rotatably fitted in the stud-receiving means, a stop member carried by the stud and normally housed in said slot, said stud being movable upwardly through the stud-receiving means to free the stop member from the slot and permit rotation of the stud, means to limit rotation of the stud and adapted to move with the stud and to project above the upper face of the stud-receiving means as the stud is moved upwardly to release the stop member from its slot, and means for slidably and rotatably moving said stud.

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