

No. 703,479.

Patented July 1, 1902.

W. W. SANFORD.
FOUNTAIN PEN.

(Application filed Apr. 22, 1902.)

(No Model.)

Fig 1



Fig 2

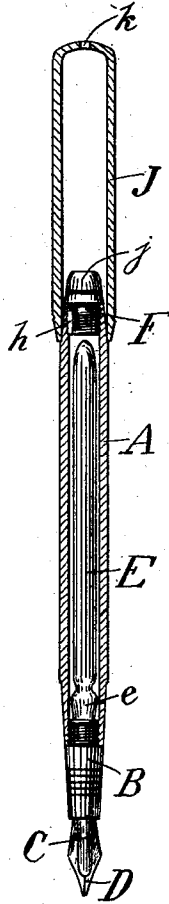


Fig 3

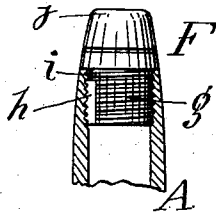
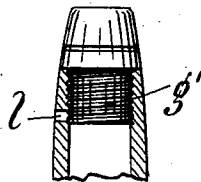


Fig 4



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM W. SANFORD, OF NEWARK, NEW JERSEY, ASSIGNOR OF ONE-HALF TO FREDERICK D. BENNETT, OF FREEHOLD, NEW JERSEY.

FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 703,479, dated July 1, 1902.

Application filed April 22, 1902. Serial No. 104,200 $\frac{1}{2}$. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. SANFORD, a citizen of the United States of America, and a resident of the city of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Fountain-Pens, of which the following is a specification.

This invention relates to improvements in fountain-pens, and particularly of that kind which are provided with a collapsible expansible ink-reservoir in the barrel. In fountain-pens of this kind there must be an opening to admit excess of air-pressure into the barrel to collapse the said reservoir, which is preferably a sack of sheet rubber having sufficient elasticity to expand to its normal size and shape when the excess of pressure is released by the same opening. Generally the excess of pressure is produced by the user's blowing into the said opening, the pen proper being at the same time dipped into an ink-bottle. When the user withdraws his lips from the opening in the barrel, the excess of air-pressure is released, the reservoir (sack) expands to its normal size and shape, and ink is sucked into the reservoir.

The combination of the collapsible expansible ink reservoir or sack with the other parts of the pen has great advantages. It facilitates filling the pen with ink, avoiding the necessity of taking out the pen and feed-bar in so doing, keeps the outside of the pen-section free of ink, so that it can be handled without soiling the hands or clothing, and diminishes the liability of the temperature of the hand when the barrel is continuously held for a considerable time from causing the ink to spurt or flow too readily from the pen; but the use of the collapsible reservoir involves the danger that the user will in various ways accidentally compress the air in the barrel, thereby collapsing the sack and causing the ink to spurt out over papers or clothes, as by the user's thoughtlessly blowing into the air-hole in the barrel or quickly pushing the cap home on the end of the barrel while accidentally closing the air-vent in the cap with his fingers. The liability to such accidental discharges of ink is a serious disadvantage in the use of the sack in pens as

heretofore employed, and it is the purpose of this invention to overcome this disadvantage.

The present invention relates particularly to the combination, with the barrel and collapsible expansible reservoir, of a valve on or in the barrel and so arranged as to open or close at the will of the user of the pen. When the sack is to be filled with ink, the pen proper is inserted into an ink-bottle, the valve is opened, and the user blows into the barrel or in any other manner produces an excess of air-pressure in the barrel to collapse the sack, the valve being open long enough to permit the excess of air-pressure to escape from the barrel to permit the sack to expand again to its normal size and shape, drawing in ink while expanding. When the sack is full, the valve is closed, and no further excess of air-pressure can be produced in the barrel to accidentally collapse the sack and spurt ink over paper and clothes. The valve thus overcomes the disadvantages connected with the use of the sack without the valve and makes the sack-pen, which I term an "automatic-filling" pen, thoroughly practicable.

Another advantage of the valve is that in case of injury to the sack the pen can be filled and used as is the ordinary fountain-pen, the valve when closed preventing the leakage of ink.

Referring to the drawings which accompany the specification to aid the description, Figure 1 is a rear elevation of the penholder or barrel and pen. Fig. 2 is a longitudinal section thereof as seen from the front of the pen. Fig. 3 is an enlarged detail of the valve shown in Fig. 2. Fig. 4 is a detail, on an intermediate scale, of a modification of the valve.

Referring to Figs. 1, 2, and 3, A is the barrel of the pen; B, the pen-section which threads or forces with tight fit into the lower end of said barrel A. C is the "feed" or feed-bar, and D the pen proper.

J is the cap, provided with the usual air-vent k and which fits on the lower end of the barrel A when the pen is not in use and on the upper end thereof when the pen is in use. On the inner end of the said pen-section B is a conical or undercut neck, on which is tightly expanded the open end or neck e of an elas-

tic sack E, preferably made of thin sheet-rubber, which fits loosely within said barrel A. There is preferably a narrow annular air-space all around said sack E between it and the wall of barrel A, and the upper end of said sack E is preferably cone-shaped, as shown, to facilitate the passage of the air which is blown into said barrel down the sides of said sack, so as to produce lateral and not end compression thereof. Said barrel A is provided with an air-inlet, and this is preferably effected by providing said barrel with an open upper end, in which fits a valve F. Said valve F has a tight working fit or threads into the end of said barrel A, (and preferably the latter, as shown,) and the stem *g* is partly cut away or grooved on one side, as at *h*, a shoulder *i* being left above the grooved or cut-away part and which makes air-tight fit with said barrel A when the valve is closed.

To fill the sack with ink, the valve is opened, and then the user either puts the valved end of the barrel into his mouth and blows into the barrel or preferably puts the cap J on the end of the barrel (the outer end, *j* of said valve F being small enough to permit the cap to go on the end of said barrel) and blows through the air-inlet *k*. The excess of air-pressure collapses said sack E, and the pen D and feed C being inserted into an ink-reservoir when the user withdraws his lips from the end of said cap J or from valve F the excess of air-pressure escapes from the barrel A, the elasticity of the sack E causes it to expand to its normal size and shape, and ink is drawn into said sack. The valve F is then closed, so that no accidental admission of excessive air-pressure into the barrel can collapse the sack and spurt out the ink.

Instead of blowing into the barrel the pressure necessary to collapse the sack when it is desired to fill the same with ink may be produced by closing the hole *k* with the finger and then pushing said cap quickly home on the end of barrel A, the valve F having been first opened. Then by removing the finger from said hole *k* the excess of air-pressure will escape from said barrel A and the sack E will expand and fill, as hereinbefore stated.

The valve can be arranged in many different ways and either outside of the barrel A or inside of it, as shown in the drawings.

Fig. 4 shows one modification of the valve

wherein the stem *g'* is not cut away; but there is an air-hole *l* in the side of the barrel. By giving the valve a turn or two upward said hole *l* will be opened. Manifestly the valve might fit around outside of the barrel A and equally well open and close said hole *l*.

Instead of making the pen-section B in a piece separate from barrel A it might be in one piece with said barrel, and the feed-bar C might be provided with the conical neck on which fits the mouth of the sack E; but the construction shown in the drawings and hereinbefore described is preferable.

Now having described my improvements, I claim as my invention—

1. The combination in a pen, of a barrel provided with an ink-feed, a collapsible expandible reservoir in said barrel, and an air-valve on said barrel, substantially as described.

2. The combination in a pen of a barrel provided with an ink-feed, an elastic collapsible sack in said barrel having its mouth communicating with said ink-feed, and a valve on said barrel adapted to admit air into the barrel to collapse said sack, and also adapted to be closed after said sack is full and to exclude external air-pressure thereafter from the filled sack, substantially as described.

3. The combination in a pen, of a barrel, a pen-section provided with an ink-feed and with a neck projecting into the barrel, an elastic expandible sack in the barrel attached at one end to said neck, and an air-valve on said barrel adapted to admit air into the barrel to collapse the sack, and to exclude external air-pressure from the barrel when the sack is filled, substantially as described.

4. The combination in a pen, of a barrel provided with an ink-feed, a collapsible expandible ink-reservoir in said barrel communicating with said ink-feed at one end, and having the other end narrowed to permit air to flow between the side of the reservoir and the barrel, and an air-valve on said barrel, substantially as described.

Signed at New York city this 17th day of April, 1902.

WILLIAM W. SANFORD.

Witnesses:

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