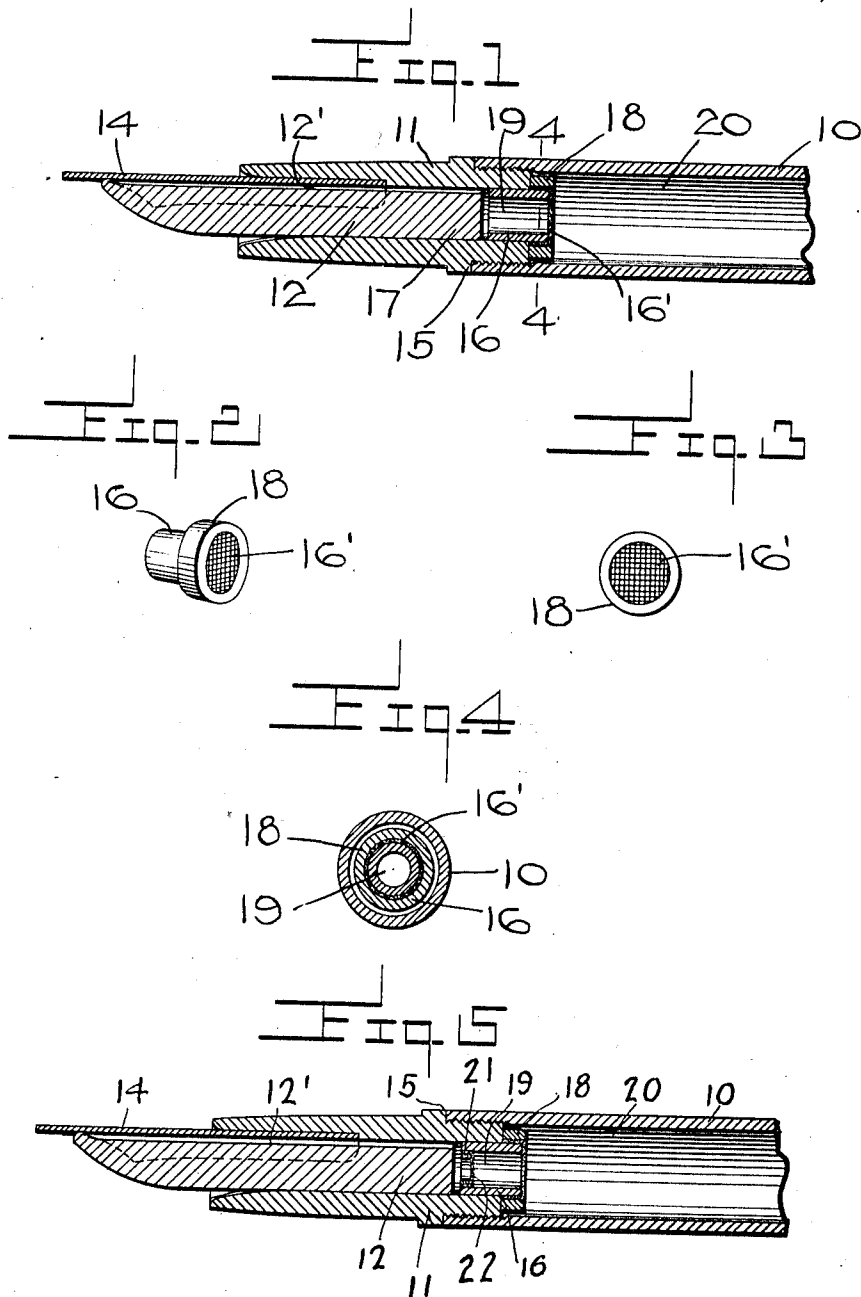


J. T. WOLFE.
 FOUNTAIN PEN.
 APPLICATION FILED OCT. 18, 1910.

1,019,874.

Patented Mar. 12, 1912.



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FOUNTAIN-PEN.

1,019,874.

Specification of Letters Patent.

Patented Mar. 12, 1912.

Application filed October 18, 1910. Serial No. 587,744.

To all whom it may concern:

Be it known that I, JAMES THRUSTON WOLFE, a citizen of the United States, residing at the Cliffbourne, in the city of Washington and District of Columbia, have invented certain new and useful Improvements in Fountain-Pens, of which the following is a specification.

This invention relates to fountain pens, and one of the objects thereof is to provide such a pen with means to prevent the "sweating" of the pen when the cap is applied.

A further object is to provide means for the purpose described, which is particularly simple of construction and so that pens already in use may be furnished with the attachment without adding greatly to their cost, while enhancing their cleanliness.

Still another object is to provide a fountain pen with means to prevent "sweating" when the pen is not in use, and to insure the most effective discharge of ink while the pen is being used.

Other objects of the invention will be in part obvious and in part specifically referred to in the course of the following description of the elements, combinations, arrangements of parts and applications of principles constituting the invention; and the scope of protection contemplated will be indicated in the claims.

In the accompanying drawings, in which I have shown a merely preferred form of embodiment of the invention; Figure 1 is a longitudinal sectional view of a pen, partly broken away, including my invention; Fig. 2 is a detail perspective of a diaphragm which may be employed in connection with my invention, together with its supporting structure; Fig. 3 is an end view of the subject matter of Fig. 2; Fig. 4 is a section on the line 4—4 of Fig. 1; and Fig. 5 is a view similar to Fig. 1, but including a modified form of embodiment of the invention.

Referring to the numerals on the drawings, 10 indicates the barrel or reservoir of a pen, one end of which is interiorly threaded in the usual manner to provide for the operative connection therewith of a tubular foot piece 11, having a reduced exteriorly threaded end defining a shoulder 15 which forms a tight joint with the end of the barrel. The foot piece 11 surrounds a feed bar 12, which is provided with the usual channel 12' through which ink feeds to the pen proper

14, and the feed bar when positioned in the foot piece, as shown in Fig. 1, extends short of the inner end of the foot piece, so that a chamber 11' is defined within the inner end of the latter, with which the channel 12' is in communication.

As an example of means for attaining the objects of my invention, I show in Figs. 1 to 4 of the drawings a sleeve 16, which is snugly held within the inner end of the foot piece 11, and extending beyond the inner end thereof, and into the barrel 10. The sleeve is preferably spaced slightly from the inner end of the feed bar 17, so as to leave open the inner end of the channel 12'. A diaphragm, which is shown in the drawings merely by way of example as of reticulated fabric, covers the inner end of the sleeve 16, the fabric 16' covering the inner end of the sleeve and having its edge portions folded down against the periphery of the sleeve, where they are held by means of a retaining ring 18 that is forced over the end of the sleeve, whereby to hold the fabric 16' in taut condition.

The diaphragm, as will be apparent, provides two chambers, 19 and 20, and separates the barrel or reservoir from the feed bar. It has been stated that the diaphragm may be of reticulated fabric, and this is probably preferable. But it should be understood that I do not desire to limit myself as to the particular form of diaphragm employed, so long as the desired functions are subserved, as hereafter explained. It will be evident that in the ordinary use of the pen, the reservoir being charged, the ink readily passes the diaphragm 16', the opening of which will, of course, be of the proper size in view of the bore of the barrel, so that surface tension may be overbalanced by capillarity and gravity. At the same time the diaphragm will interpose sufficient resistance to prevent too free flow of ink, as when the pen is suddenly brought from point-up position to point-down position. When the user places the cap over the pen point and carries the pen in his pocket point up, a film of ink, under influence of surface tension, forms over the diaphragm and all the interstices thereof, constituting a film seal for the barrel or reservoir, which prevents "sweating" of the pen, the surface tension under which this film obtains exceeding that of capillarity alone, as will be understood, but being overcome by gravity and capil-

larity when the pen is in use, because of the size of the openings in the diaphragm, so that ink may flow with the proper freedom for writing. Consequently, when the cap is removed, it will be found that no evaporation has taken place from the reservoir through the feed bar which, followed by condensation upon the nib and foot-piece and the inner surface of the cap, comprises the "sweating" which is so serious an objection to fountain pens as heretofore known.

Whether or not my theory of the operation of the device is correct, it is nevertheless true that by the provision of a diaphragm at the outer end of the reservoir which will hold a film of liquid under surface tension to seal the reservoir against evaporation, "sweating" is prevented.

In Fig. 5 I have shown a modified form of the invention, which differs from that shown in Fig. 1, to the extent that the end of sleeve 16 opposite the diaphragm 16' is provided with a second diaphragm 22, which overlies and has its edges turned down upon a retaining ring 21, so that when the latter is slipped into the end of the sleeve 16, the edge portions of the diaphragm will be held between the ring and the sleeve 16, maintaining the diaphragm taut. By the provision of this second diaphragm, I am enabled to procure a second film seal for the reservoir, thereby the more effectually to prevent "sweating," while at the same time the chamber comprehended between the two diaphragms may ordinarily retain a supply of ink immediately available for the feeding of the pen. Obviously whether this chamber, when the pen is held point up, holds its supply of ink or not, it will provide either a substantial liquid seal, or a double film seal for the reservoir, capillarity alone, as explained, being insufficient to draw the ink upwardly therefrom.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention, which as a matter of language, might be said to fall therebetween.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. The combination in a fountain pen, of a reservoir and a foot-piece detachably connected and having their respective communicating passages separated by a partition of reticulated material whose openings are of such size that the diaphragm will support a liquid film between the parts when the pen is up-ended, while permitting free flow of ink therethrough from the reservoir when the pen is in use.

2. The combination with a fountain pen, of a reservoir and a foot-piece detachably connected and having their respective communicating passages separated by a diaphragm structure, the latter having a plurality of openings of such a size that the diaphragm will support a film of ink between the parts when the pen is up-ended, the ratio of the area of the openings to the area of the diaphragm structure being such as to permit capillarity and gravity to overcome surface tension, thereby permitting free flow of ink therethrough from the reservoir when the pen is in use.

3. The combination in a fountain pen having an ink reservoir and a pen nib, of a diaphragm structure, separating the reservoir and the pen nib, said diaphragm being provided with a plurality of openings of such proportion that the diaphragm will support films of ink in its interstices, and that the ratio of the area of the openings to the area of the diaphragm structure is such as to permit ink freely to pass therethrough in the act of writing.

In testimony whereof I affix my signature, in the presence of two witnesses.

JAMES THRUSTON WOLFE.

Witnesses:

ERNEST H. RILEY,
THAD. B. SARGEANT.