

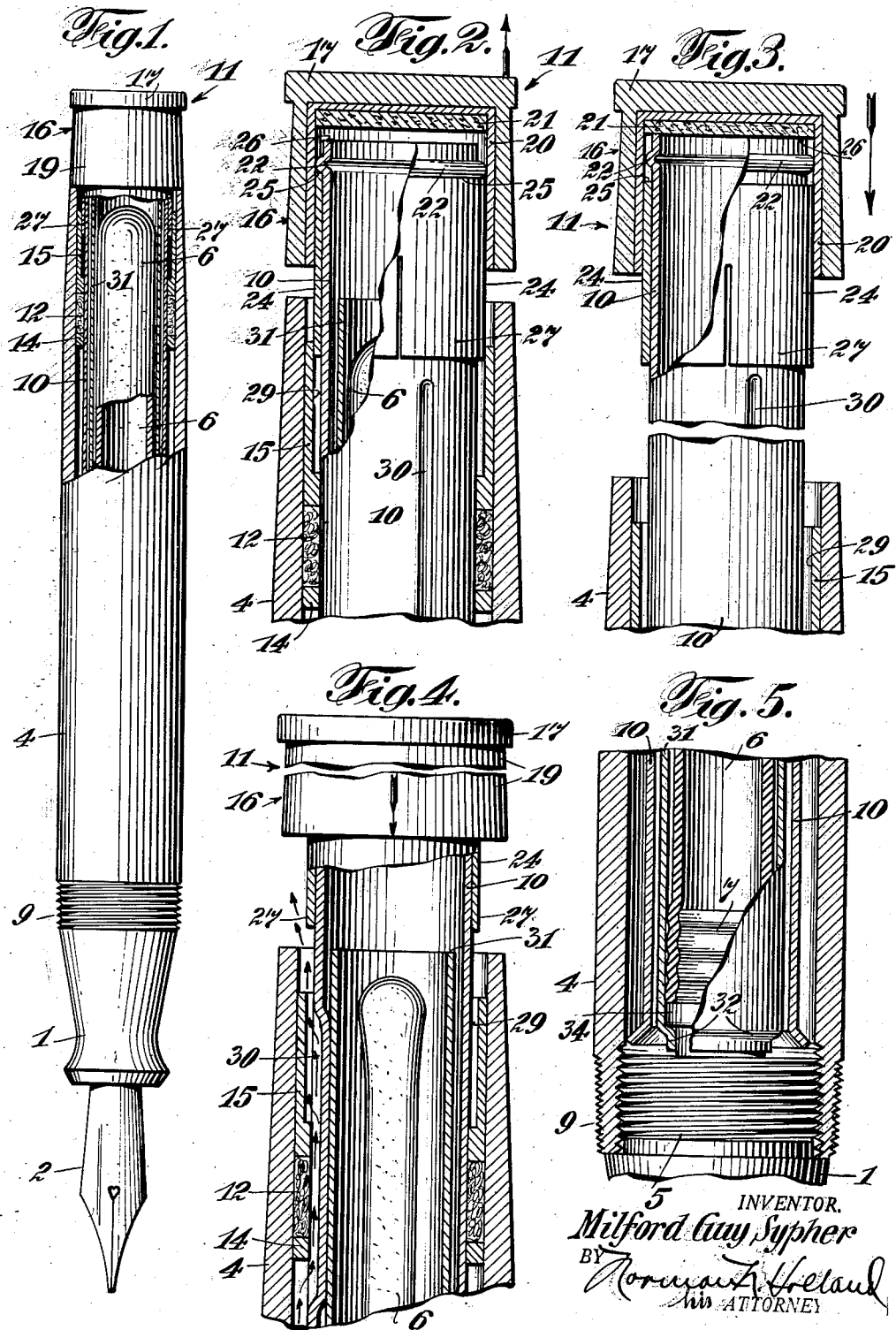
Dec. 6, 1938.

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2,139,045

FOUNTAIN PEN

Filed Dec. 22, 1937



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UNITED STATES PATENT OFFICE

2,139,045

FOUNTAIN PEN

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Application December 22, 1937, Serial No. 181,080

14 Claims. (Cl. 120—47)

The present invention relates to fountain pens and more particularly to self-filling pens which utilize air pressure for deflating the sac.

A popular fountain pen is illustrated in my prior Patent No. 2,017,109, dated October 15, 1935, and comprises a barrel, an ink sac, and a slidable tube telescoped into the barrel to form a chamber about the ink sac. The free end of the tube has a valve device attached thereto adapted to vent the chamber when the tube is retracted to enlarge the chamber and adapted to trap the air in the chamber and compress it while the tube is being returned to deflate the sac. The valve device may then be operated to vent the chamber and permit the sac to inflate and fill itself with ink. Thereafter, the valve device may be locked to the barrel to prevent accidental movement of the tube with respect to the barrel.

The present invention is an improvement over the above described fountain pen, and aims to simplify and reduce the number of parts and cost of the valve construction, and to increase the life of the pen. The invention further aims to improve the operation of the pen by the use of automatic venting means and eliminating the necessity of skill on the part of the user.

Generally, these objects are attained by mounting a valve button on the end of the tube adapted to vent the chamber while the tube is being retracted and adapted to close the chamber while the tube is being returned. A suitable venting groove or channel is formed in the tube which, just prior to the end of the return stroke, automatically vents the chamber without manual operation of the valve button. The button is adapted to be frictionally secured to the barrel, so that during the return stroke, the compressing, venting and locking operations are performed in a single stroke. Preferably, the button is rotatable with respect to the tube to prevent the tube from rotating and twisting the sac.

An object of the present invention is to provide a simple, inexpensive fountain pen filled by an air pressure mechanism.

Another object of the invention is to provide a pen of the above type which is adapted to be filled in fewer operations and without requiring skill or ingenuity on the part of the user.

Another object of the invention is to provide a pen having automatic venting means.

Another object of the invention is to provide an improved means for locking the tube to the barrel.

Another object of the invention is to provide friction means for locking the tube to the barrel

so that the tube may be locked by continuing the filling stroke.

Another object of the invention is to provide a pen which is sturdier in construction and is less likely to be damaged when used by unskilled persons.

A further object of the invention is to prevent twisting of the ink sac and increase the ink capacity and the life of the pen.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawing, forming a part of the specification, wherein

Fig. 1 is an elevational view, partly in section, of a fountain pen illustrating a preferred embodiment of the present invention;

Fig. 2 is an enlarged fragmentary sectional view, illustrating the operation of an improved valve device while the tube is being retracted from the barrel;

Fig. 3 is an enlarged fragmentary sectional view, illustrating the operation of the valve device at the commencement of the return stroke;

Fig. 4 is an enlarged fragmentary sectional view, illustrating the operation of the automatic venting means; and

Fig. 5 is an enlarged fragmentary sectional view, illustrating a preferred manner of attaching a tube to the pen section for protecting the ink sac.

Referring again to the drawing, there is shown a fountain pen comprising a gripping section for mounting a pen point, a barrel attached to the gripping section by suitable threads and a collapsible ink sac within the barrel secured to a nipple portion of the gripping section. The lower end of the barrel may be provided with threads for attaching a pen point protecting cap (not shown) to the barrel.

The filling mechanism comprises a tube slidably telescoped within the barrel and a valve device (Figs. 2, 3 and 4) about to be described in detail, which is mounted on the upper or free end of the tube. The tube is adapted to be retracted to enlarge the chamber or the air space about the ink sac and is adapted to be re-

turned to compress the air and deflate or collapse the sac through the cooperation of the valve device 11, and a suitable annular packing or gasket 12 intermediate the tube and the outer barrel. Preferably, the packing is held in position by a lower annular member 14 and an upper collar or annular member 15 secured within the barrel substantially at the upper end thereof (Figs. 1 and 4).

A preferred form of valve device comprises a button or cap member 16 (Figs. 2, 3 and 4) having an end portion 17 and a depending flange or skirt 19, a cap or shell 20, preferably of metal, permanently secured within the button, and a gasket disc 21 seated at the upper end of the shell 20. Preferably, the valve device is attached to the slidable tube 10 by forming a bead, rib or outwardly extending projection 22 substantially at the upper end thereof, inserting the upper end of the tube into the shell 20 and telescoping and permanently securing a relatively short tube 24 within the shell 20. The tube 24 encompasses the tube 10 and its upper end 25 is adapted to engage the rib 22 to permit limited sliding movement between the button 16 and the tube 10. The extent of this movement preferably is relatively slight, but sufficing to move the gasket 21 away from the upper end 26 of the tube 10 when the button and tube are retracted to vent the chamber (Fig. 2) and to permit the gasket to seal the tube when the button is pushed downwardly to move the tube 10 into the barrel (Fig. 3).

Preferably, the tubes 10 and 24 are relatively rotatable to permit the button to rotate freely with respect to the tube 10. This is a very advantageous feature because if the user unintentionally rotates the button, the tube 10 will not be rotated. As a result, the ink sac is not distorted or damaged to reduce the ink capacity thereof. This is very desirable because the ink sac will retain its shape and hold a greater amount of ink throughout its life. Accidental rotation of the tube 10 usually is prevented by having the packing 12 fit tightly about the tube. If desired, the tube may be locked positively against rotation with respect to the barrel by a projection at the lower end of the tube fitting into a longitudinal groove of the barrel.

Another advantageous feature of the present valve device is that the tube 24 may be provided with means for locking the button to the barrel to prevent accidental movement of the tube 10. This may be accomplished by having the lower end of the tube project downwardly from the skirt 19 of the button and slitting it at two or more points to form spring fingers 27 adapted to fit into and frictionally engage the inner periphery of the upper annular member 15. If desired, the upper portion of the annular member 15 may have an enlarged inner diameter or a tapered bore 29 to facilitate reception and engagement of the spring fingers 27. The use of friction locking means adapted to be operated by continuing the return stroke of the tube eliminates any turning of the button or tube 10 which might twist the sac. Furthermore, the locking means are greatly simplified by reducing the number of parts and the assembling operations required.

A further aim of the invention is to automatically vent the chamber at the end of the compression stroke to permit the sac to inflate and fill itself with ink. This is accomplished by forming one or more lengthwise extending inwardly disposed grooves or channels 30 at the upper portion of the slidable tube 10 of sufficient length to bridge

or span the packing gasket 12 at substantially the completion of the filling stroke (Fig. 4). This permits the compressed air within the chamber to escape automatically and restore the chamber to atmospheric conditions without an additional operation on the part of the person using the pen. For example, at the end of the filling stroke, the button need not be retracted to release the air. The compressing, venting and locking of the button to the barrel can be performed by moving the tube to its original position in a single stroke.

A feature of the automatic venting means is that the grooves or channels 30 can be accurately positioned with respect to end of the tube 10 and the gasket or packing 12 to permit venting of the chamber at the end of the compression or return stroke of the tube after the ink sac has been completely deflated. This enables the sac to be filled to its maximum capacity in every instance. Also, the venting means are positive in operation and are not dependent upon springs or complicated valve constructions. The grooves or channels can be readily formed in the tube 10 without increasing the cost of the pen.

In Fig. 5 a suitable shielding tube 31 is shown intermediate the sac and the slidable tube 10 which prevents the tube from rubbing against the sac to weaken it or impair its operation. Also, by reason of the shielding tube, the sac may have a larger diameter to increase its ink capacity and may fit snugly in the tube to prevent swelling or buckling of the sac. Preferably, the shielding tube is attached to the upper end of the pen gripping section by rolling the lower end of the tube 31 inwardly or by suitable inwardly extending portions 32 adapted to extend beneath a shoulder 34 or the like on the nipple portion 7 of the gripping section.

In order to fill the ink sac, the button or cap 16 is manually engaged and pulled outwardly from the upper end of the barrel to retract the slidable tube 10 and enlarge the air chamber about the sac (Fig. 2). During this movement, the button moves the gasket 21 out of sealing position to permit air to enter the chamber. Thereafter, the pen point 2 is placed into a supply of ink and the button is pushed towards the upper end of the barrel to return the tube to its normal position (Fig. 3). At the start of the return stroke, the button moves towards the tube 10 and the gasket 21 seals the chamber to entrap the air therein. During the return stroke, the air is compressed and exerts sufficient pressure on the sac to effect substantially complete deflation thereof. Just prior to the end of the return stroke the lower end of the groove or channel 30 extends beneath the packing 12 and the upper end extends above the packing to permit the compressed air to escape as indicated by the arrows (Fig. 4). Due to the restoration of atmospheric pressure in the chamber, the sac inflates and is filled with ink. Upon continuing the return stroke to its completion, the spring fingers 27 are wedged into the annular member 15 and the tube 10 is locked in writing position (Fig. 1).

It will be seen that the present invention provides an improved air pressure filling mechanism for fountain pens and the like adapted to be constructed of fewer parts and in fewer assembling operations to materially reduce the cost thereof. Another advantage is that the ink sac cannot be twisted or distorted whereby the pen is less likely to be impaired when in the hands of careless persons. The filling operation is greatly simplified by combining the compressing, venting and lock-

ing steps, and elaborate instructions or skill and ingenuity on the part of the user are not required. The present pen is rugged in construction and can readily withstand any rough usage to which it may be subjected.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. In a fountain pen of the class described, the combination of an ink sac, a pair of telescoping slidable tubular members adapted to form a chamber about said ink sac whereby said chamber may be enlarged by retracting said tubular members with respect to each other and whereby said chamber may be reduced to its normal size by returning said tubular members to their original position to compress the air therein and collapse the ink sac, and manually engageable means attached to the end of one of said tubular members adapted to close the chamber when said tubular members are returned, one of said tubular members having a groove therein adapted to vent the chamber while returning said tubular members to their original position.

2. In a fountain pen of the class described, the combination of an ink sac, a pair of telescoping slidable tubular members adapted to form a chamber about said ink sac whereby said chamber may be enlarged by retracting said tubular members with respect to each other and whereby said chamber may be reduced to its normal size by returning said tubular members to their original position to compress the air therein and collapse the ink sac, a packing between said tubular members, and a cap member attached to the end of one of said tubular members having a gasket adapted to fit against the end of said tubular member to which the cap is attached to close the chamber when said tubular members are returned, one of said tubular members having a longitudinally extending elongated groove adapted to vent the chamber while returning said tubular members to their original position.

3. In a fountain pen of the class described, the combination of an ink sac, a pair of telescoping slidable tubular members adapted to form a chamber about said ink sac whereby said chamber may be enlarged by retracting said tubular members with respect to each other and whereby said chamber may be reduced to its normal size by returning said tubular members to their original position to compress the air therein and collapse the ink sac, and manually engageable means attached to the end of and slidable with respect to one of said tubular members adapted to vent the chamber when said tubular members are being retracted, one of said tubular members having a channel portion adapted to vent the chamber while returning said tubular members to their original position.

4. In a device of the class described, the combination of a barrel, an ink sac, a tube slidable with respect to said barrel adapted to form a chamber about said ink sac, and means slidably attached to one end of said tube adapted to open and close the chamber to atmosphere, said tube having a groove adjacent said means for independently venting the chamber.

5. In a device of the class described, the com-

bination of an ink sac, a pair of telescoping tubular members providing a chamber about said ink sac, and a packing intermediate said tubular members, one of said tubular members having a groove at one end thereof adapted to span said packing while said tubular members are being telescoped together to vent the chamber.

6. In a device of the class described, the combination of an ink sac, a pair of telescoping tubular members providing a chamber about said ink sac, a packing intermediate said tubular members, and means associated with one of said tubular members adapted to vent the chamber when said tubular members are retracted and adapted to close the chamber while said tubular members are being telescoped together, one of said tubular members having a groove at one end thereof adapted to span said packing while said tubular members are being telescoped together to vent the chamber independently of the operation of said means.

7. In a device of the class described, the combination of a barrel, an ink sac, a tube telescopically slidable with respect to said barrel adapted to form a chamber about said ink sac, a packing intermediate said tube and barrel, said tube having a groove adapted to bridge said packing to vent the chamber, and means at one end of said tube for closing the chamber.

8. In a device of the class described, the combination of a barrel, an ink sac, a tube telescopically slidable with respect to said barrel adapted to form a chamber about said ink sac, a packing at one end of said barrel intermediate said tube and barrel, said tube having a groove therein adapted to bridge said packing to vent the chamber, a cap attached to the end of said tube, and a gasket in said cap adapted to fit against the end of said tube to close the chamber.

9. In a device of the class described, the combination of a barrel, an ink sac, a tube telescopically slidable with respect to said barrel adapted to form a chamber about said ink sac, a packing intermediate said tube and barrel, said tube having a groove adapted to bridge said packing to vent the chamber, and a cap rotatably attached to one end of said tube having a gasket for closing the chamber.

10. In a fountain pen of the class described, the combination of an ink sac, a pair of telescoping slidable tubular members adapted to form a chamber about said ink sac whereby said chamber may be enlarged by retracting said tubular members with respect to each other and whereby said chamber may be reduced to its normal size by returning said tubular members to their original position to compress the air therein and collapse the ink sac, a cap attached to and rotatable with respect to one of said tubular members having a gasket for closing said last tubular member, one of said tubular members having a channel adapted to vent the chamber while returning said tubular members to their original position.

11. In a device of the class described, the combination of a pair of relatively slidable telescoping tubular members adapted to form a chamber about an ink sac, a cap mounted on one of said tubular members having resilient portions adapted to frictionally engage the end of the other of said tubular members, to hold said members against accidental movement with respect to each other.

12. In a device of the class described, the combination of a barrel, an ink sac, a tube telescoped

into and slidable with respect to said barrel, a collar secured to one end of said barrel, and a cap mounted on said tube having resilient fingers adapted to extend into said collar and frictionally engage said collar to prevent accidental movement between said tube and barrel.

13. In a device of the class described, the combination of a barrel, a tube in said barrel slidable with respect thereto and cooperating to provide a chamber, a packing intermediate said tube and barrel, an ink sac mounted within said tube, a stationary tube intermediate said ink sac and said slidable tube adapted to shield said ink sac, and means at one end of said slidable tube adapted to open and close the chamber, said slidable tube having a groove therein adapted to span

said packing and vent the chamber independently of said means.

14. In a fountain pen of the class described, the combination of an ink sac, a pair of telescoping relatively slidable tubular members adapted to form a chamber about said ink sac, one of said tubular members having an outwardly extending projection at the upper end thereof, a button member, a gasket in said button member, and a sleeve in and secured to said button member, said sleeve having its upper end spaced from said gasket and positioned to engage the projection of said tubular member to permit limited sliding movement of said button with respect to said last tubular member.

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