

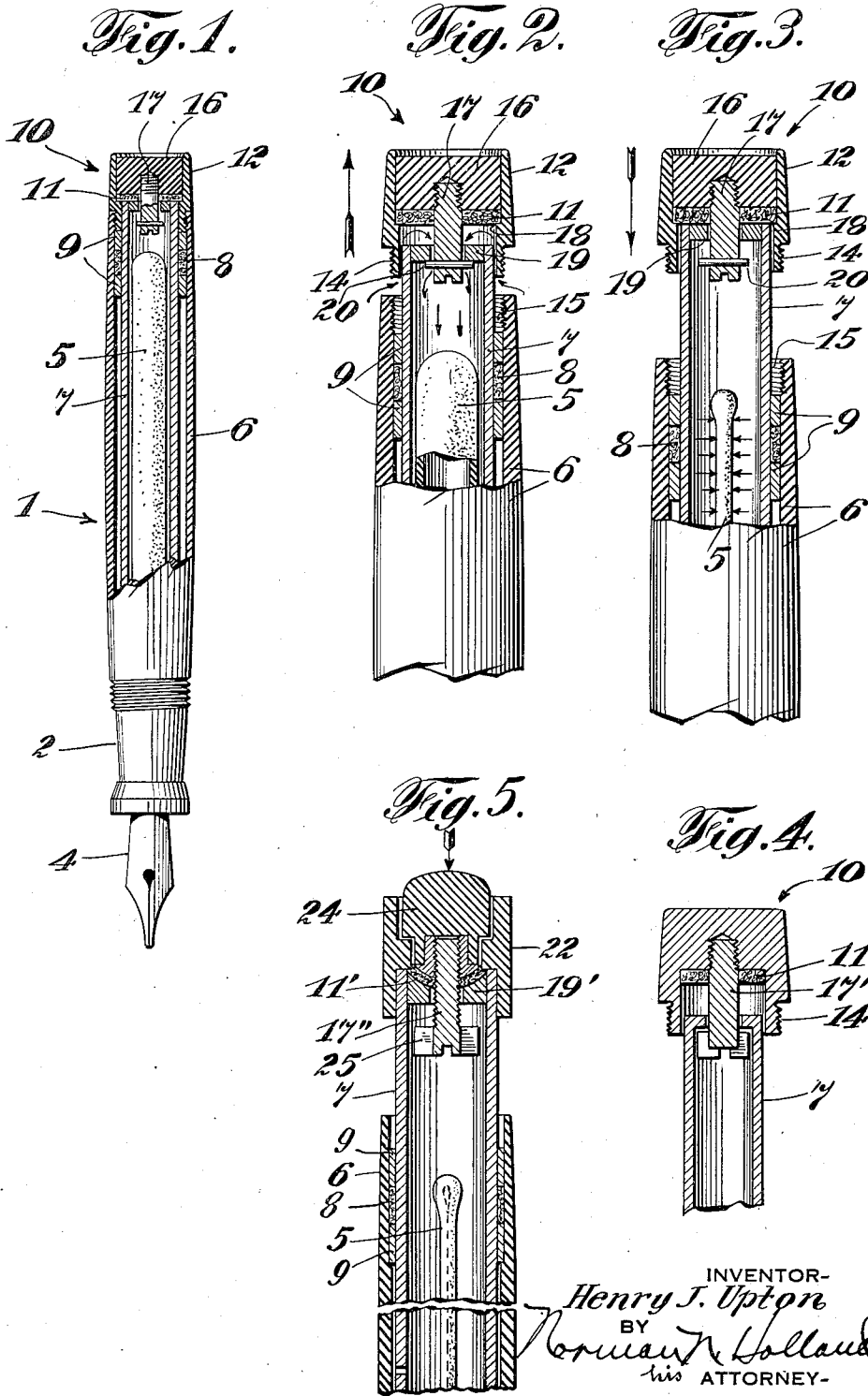
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H. J. UPTON

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FOUNTAIN PEN

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INVENTOR-
Henry J. Upton
BY
Norman Hollaud
his ATTORNEY-

UNITED STATES PATENT OFFICE

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FOUNTAIN PEN

Henry J. Upton, West Medford, Mass., assignor,
by mesne assignments, to The Chilton Pen Com-
pany, Inc., Long Island City, N. Y., a corpora-
tion of New York

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The present invention relates to fountain pens and more particularly to the type utilizing air pressure for collapsing the ink sac during the filling operation.

5 There are several types of self-filling fountain pens utilized at the present time. Practically all of them have an ink sac, usually made of rubber, for containing the ink. The pen is filled by deflating the sac and permitting it to inflate
10 when the pen is immersed in ink. Perhaps the best known mechanism for deflating the rubber sac to fill the pen is that in which a pressure bar inside the barrel is operated by a lever to deflate the sac. Among the objectionable features
15 of the lever pen is the fact that the ink sac cannot be entirely deflated by the pressure bar. As a result, the ink sac is never completely filled. In addition, the pressure bar takes up considerable space in the barrel, making it necessary to use a smaller sac. Another type of self-filling pen uti-
20 lizes air pressure for deflating the sac, is shown in my Patent, No. 1,883,160, dated October 18, 1932. Air pressure has the advantage of being effective on all parts of the ink sac, thereby
25 entirely collapsing it and permitting it to completely fill with ink. In addition, a larger ink sac may be used since there is no pressure bar in the barrel. This type of pen has a greater ink capacity than the same size lever pen, which is
30 an important advantage.

The usual mechanism for creating the air pressure is shown in my patent identified above and comprises a pair of telescoping barrels, one of which is withdrawn to increase the size of the
35 chamber about the ink sac. An aperture in the end of the pen maintains atmospheric pressure within the chamber during withdrawal of the barrel. The aperture is closed by placing the finger over it while the barrel is being returned
40 to its original position. The air, not being permitted to escape through the aperture, increases in pressure about the ink sac and collapses it. The pen is then immersed in ink and the finger removed from the aperture to permit the com-
45 pressed air to escape and the ink sac to inflate and fill with ink.

The main difficulty with this method of filling is that the operator has difficulty in learning to fill the pen. In addition, the operator frequently does not cover the aperture completely and, of course, the ink sac is not deflated and the pen does not fill. In other cases, the operator will close the aperture when the barrel is retracted, which creates an undesirable vacuum and pre-
55 vents complete filling. These difficulties in filling

have occasioned a number of complaints and the loss of sales.

The present invention aims to overcome these difficulties by retaining the advantageous features of the pressure pen and simplifying the filling operation so that anyone can fill it properly.

An object of the present invention is to improve the filling mechanism for fountain pens.

Another object of the invention is to simplify the filling operation of pens utilizing air pressure for deflating the ink sac.

Another object of the invention is to automatically open the chamber about the ink sac to atmosphere at the commencement of and during the time the barrel is retracted to enlarge the chamber.

Another object of the invention is to automatically close the chamber to atmosphere at the commencement of and during the return movement of the barrel to decrease the size of the chamber and to create air pressure therein.

Another object of the invention is to automatically open the chamber about the ink sac to atmosphere at the commencement of and during the retraction of the barrel to enlarge the chamber and to automatically close the chamber to atmosphere at the commencement of and during the return movement of the barrel to compress the air therein and to release the air pressure when the barrel has reached its return position to permit the ink sac to fill with ink.

Another object of the invention is to open the chamber about the ink sac to atmosphere at the commencement of the retraction of the barrel, to prevent the formation of a vacuum, and to close the chamber at the commencement of the return movement of the barrel to obtain the benefit of a full stroke of the outward and inward movement of the barrel.

Other and further objects of the invention will be obvious upon an understanding of the illustrated 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 is shown in the accompanying drawing, forming a part of the specification, wherein

Fig. 1 is a sectional view, partly in elevation, illustrating a preferred embodiment of the present invention applied to a pen, the parts being in normal position;

Fig. 2 is a fragmentary sectional view illustrating the position of the parts when the tube is

being retracted to increase the size of the chamber about the ink sac;

Fig. 3 is a fragmentary sectional view illustrating the position of the parts during the return of the tube to its original position, that is, the compression stroke;

Fig. 4 is a fragmentary sectional view illustrating another way of forming the parts; and

Fig. 5 is a fragmentary sectional view illustrating a slightly different construction.

Referring again to the drawing, there is shown a pen 1 having a pen section 2 and a pen point 4 of the usual construction. An ink sac 5 may be secured in any suitable manner to the pen section, and a barrel 6 may be attached to the pen section. It will be understood that the parts described may be made of any suitable material, such as hard rubber, pyroxylin, or other types of material.

For the purpose of filling the pen, there are provided a pair of telescoping barrels or tubes, one of which may be the barrel 6 of the pen and the other an inner tubular member 7, preferably made of metal. A packing 8, as illustrated in my patent identified hereinbefore, may be provided between the two barrels to afford a substantially air-tight joint, and may be held in place by a pair of sizing rings 9. The two barrels 6 and 7 form a chamber about the ink sac 5.

A button 10 may be secured to the upper end of the barrel 7, for manual operation thereof. Preferably, the button is secured to the end of the barrel through the intermediation of a gasket or other packing 11 and through a loose connection for opening and closing the end of the barrel 7. This may be done by making the button 10 with an outer shell 12 having threads 14 at its lower end adapted to engage the threads 15 on the inner upper end of the barrel 6 and an inner cylindrical member 16 swaged into position. Preferably, the member 16 has a threaded recess therein adapted to receive the threaded member 17, the gasket or packing 11 fitting about the member 17 and being held in position by the cylindrical member 16 and the shoulder 18 on the shell 12. The upper end of the tube 7 may have a ring member 19 soldered in position to provide substantially an inturned flange on the tube 7 and the lower end of the member 17 may extend through said ring and be secured therein by means of a pin 20.

The parts may be readily assembled by first assembling the shell 12, cylindrical member 16 and gasket 11. Thereafter, the member 17, with the pin 20 therein, may be dropped into the tube 7 and a screw driver utilized for screwing the member 17 into the cylindrical member 16.

In Fig. 4, a slightly different construction is shown, wherein the button 10 is made from a single block of material and the upper end of the tube 7 is flanged inwardly. The gasket 11 may be secured to the button 10 by adhesive or it may be permitted to remain loose about the cylindrical member 17' and instead of utilizing a pin, such as pin 20, the lower end of the member 17' may be flanged to engage the flange on the upper end of the tube 7. The member 17' is slidably and rotatably mounted to the end of the tube 7 so that the button 10 is rotatable with respect to the tube 7. In this manner, if the button is twisted or rotated, the tube will not be rotated and will not interfere with or twist the ink sac 5. The operation is essentially the same as the construction described in Figs. 1 to 3. The parts may, in some cases, be more desirable from a manufacturing standpoint.

In the operation of the filling mechanism described above, the button 10 is engaged and unscrewed from the barrel 6. Thereafter, it is retracted, as illustrated more particularly in Fig. 2, until the bottom end of the tube 7 engages the sizing rings 9 to limit the outer movement thereof. As soon as the button 10 is engaged to pull the tube 7 out, the packing 11 is raised from the end of the tube 7, as shown in Fig. 2, so that air may enter around the end of the tube by reason of the loose fit of the button 10 about the tube 7 and by the removal of the packing 11 from the end of the tube 7. The chamber formed by the pair of telescoping tubes about the ink sac 5 is opened to atmosphere at the commencement of and during the retraction of the tube 7. It will be noted that the chamber about the ink sac is increased to substantially twice its normal size by the retraction of the tube. As soon as the button 10 is engaged to return the retracted tube to its original position, the packing 11 is pressed against the end of the tube 7 to close the chamber about the ink sac 5 and as the tube is returned, the air is held within the chamber while the chamber is decreased to substantially its original size and the air pressure is substantially doubled, since the size of the chamber is halved. In other words, an unbalanced pressure of several pounds per square inch is effective to collapse the ink sac, as shown in Fig. 3, which results in its being flattened and all the air driven out of it. As soon as the button is released, the pressure in the chamber operates to raise the button and permit the compressed air to escape. The pen is immersed in ink prior to the release of the button. As the air escapes from the barrel, the ink sac inflates and fills with ink. Thereafter, the button 10 is screwed into position on the barrel 6.

A slightly different construction is shown in Fig. 5, in which a member 22 is secured to the upper end of the barrel 7. The ring 19', in the end of the tube 7, preferably has a substantially spherical seat to accommodate a packing 11'. A button 24 is movably mounted in the member 22 and has a cylindrical member 17'' secured therein, with the lower end of the member having a projection 25 adapted to engage the ring 19' to hold the button 24 in movable position. The operation of this construction will be clear from the preceding description. The member 24 is pressed downwardly to close the chamber and, when released, permits the chamber to open to atmosphere. If desired, a suitable spring may be utilized to hold the member 24 in its upper position. One ordinarily would engage the top of the tube to return it to its original position and this would press the button 24 downwardly to close the chamber during the filling operation. The compressed air would open the chamber to atmosphere by raising the button 24 after the tube has been returned.

It will be seen that the present invention simplifies the filling of pressure pens. The pressure chamber about the ink sac is automatically opened and closed to atmosphere. The operator merely retracts and returns the movable barrel by means of the button, the automatic mechanism opens and closes the interior thereof to atmosphere at the proper time to deflate the ink sac and to fill the pen. The construction is inexpensive and simple in construction and the parts may be readily repaired if necessary.

As various changes may be made in the form, construction and arrangement of parts herein without departing from the spirit and scope of the invention and without sacrificing any of its ad-

vantages, 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, the combination of a pair of telescoping tubes, one of said tubes having a button slidably attached to the end thereof for manual engagement to move one of said tubes with respect to the other, an ink sac within said tubes, means for opening the chamber within said tubes and about said ink sac to atmosphere when said button is engaged to retract one of said tubes, and means on said button for locking said telescoping tubes in their normal position.
2. In a fountain pen, the combination of a pair of telescoping tubes adapted to form a chamber for an ink sac, an ink sac within said tubes, one of said tubes having an aperture at the end thereof, a packing secured to one of said tubes and intermediate said tubes, a button attached to an end of one of said tubes, and a disc packing intermediate said button and the end of said tube having the aperture therein, said disc being adapted to abut against the end of said tube to close said tube to atmosphere.
3. In a fountain pen, the combination of an ink sac, a pair of telescoping barrels forming a chamber about the ink sac, one of said barrels, having an aperture therein, a member slidably mounted in said aperture, and a packing secured about said member, said packing being adapted to be pressed against the aperture in said barrel to close said chamber to atmosphere.
4. In a fountain pen, the combination of an ink sac, a pair of telescoping barrels forming a chamber about the ink sac, a member secured to the end of one of said barrels, having an aperture therein, a second member slidably mounted in said aperture, a packing about said second member, said packing being adapted to be pressed against the aperture to close said chamber to atmosphere, and to be moved away from the aperture to open said chamber to atmosphere.
5. In a fountain pen of the class described, the combination of a pair of telescoping barrels, a ring member secured in the end of one of said barrels, a member extending through and movably connected to said ring member, a packing about said movably connected member adapted to be pressed against the end of one of said barrels and a button secured to said movably connected member.
6. In a fountain pen, the combination of an ink sac, a pair of telescoping tubular members adapted to form a chamber about said ink sac whereby the effective air space about said ink sac may be increased by retracting one of said members and may be reduced by returning said tubular member toward its original position, the inner of said tubular members having an aperture at its end, a button movably attached to the inner telescoping member, and means associated with said button for automatically venting said chamber at the commencement of and during the retraction of said tubular member to prevent the formation of a partial vacuum in said chamber.
7. In a fountain pen, the combination of a barrel, an ink sac, a tube slidable with respect to said barrel, said tube having an aperture therein, a member slidably mounted in said aperture, a button secured to said member and a packing extending about said member adapted to close said aperture.
8. In a fountain pen, the combination of a barrel, an ink sac, a tube telescoped into said barrel, a member secured to the end of said tube having an aperture therein, a pin extending upwardly through said aperture, a button attached to said pin and slidably mounted on said tube by means of said pin, and a gasket in said button for closing said aperture.
9. In a fountain pen of the class described, the combination of a slidable tube having an aperture at one end thereof, a member slidably mounted with respect to said tube, a tubular part provided with a recess, a packing seated in said recess for closing said aperture, and a cylindrical part above said packing secured to said tubular part, said member being secured to said cylindrical part.
10. In a fountain pen of the class described, the combination of a slidable tube having at one end thereof an inwardly extending flange portion provided with an aperture, a member extending through said aperture and slidably mounted on said tube, said member having an enlarged portion at one end and screw threads at the other end, a button threaded to said member, and a packing in said button for closing said aperture.
11. In a fountain pen, the combination of a barrel, a slidable tube telescoped into said barrel, a member on said tube having a substantially concave seat provided with an aperture, a button slidably mounted on said tube, and a gasket in said button adapted to fit against the seat of said member and close the aperture.
12. In a fountain pen, the combination of a pair of telescoping tubes forming a chamber for an ink sac, one of said tubes having a button on the end thereof for manual engagement to move one of said tubes with respect to the other, an ink sac within said tubes, a gasket associated with said button adapted to seal the end of the tube to which the button is attached, the chamber within said tubes and about said ink sac being opened to atmosphere by engaging said button to retract one of said tubes.
13. In a fountain pen, the combination of a barrel, a slidable tube telescoped into said barrel, a button secured to the end of said tube to facilitate manipulation thereof, said tube having an aperture at the end thereof for opening the interior of the tube and barrel to atmosphere when said button is utilized to retract said tube, and means adapted to close the aperture and the interior of said tubes to atmosphere when said button is utilized to return the retracted tube to its original position.
14. In a fountain pen, the combination of a pair of telescoping tubes, a button slidably attached to the end of one of said tubes to facilitate manipulation thereof, one of said tubes having an aperture at the end thereof for opening the interior of the tubes to atmosphere when said button is utilized to retract one of said tubes, and means associated with the button adapted to close the aperture and the interior of said tubes to atmosphere when said button is utilized to return the retracted tube to its original position, and screw threads on said button adapted to engage threads on one of said tubes to lock said tubes in closed position.
15. In a fountain pen, the combination of a barrel, an inner barrel telescoping within said outer barrel, said inner barrel having its upper end partially closed, a ring adapted to partially close the upper end of the inner barrel, a cap having a packing disc therein, means for attaching said cap to said ring whereby said cap will be movable to and from the end of said inner tube

to compress said packing against the end of said tube to close the interior thereof to atmosphere.

16. In a fountain pen, the combination of an outer hollow member, said hollow member having a shoulder on the inside thereof, a disc of packing material resting against said shoulder, and a member fitting into said hollow member and resting against said packing to hold it firmly in position on said shoulder.
17. In a fountain pen, the combination of a pair of telescoping barrels, a cap for one of said barrels having a hollow member with a shoulder on the interior thereof, a packing resting against said shoulder, a member fitting into said hollow member to hold said packing rigidly in position against said shoulder, means for securing said cap to one of said telescoping members, means providing a loose connection between said telescoping member and said pen cap, and means for connecting said member for holding the packing in the cap to the inner telescoping barrel to permit relative movement therebetween so that the packing may be pressed against the end of the inner barrel and pulled away from it to close and open the barrel to atmosphere.
18. In a fountain pen, the combination of a pair of telescoping tubes, an ink sac within one of said tubes, an annular member seated in and secured to one of said tubes, said annular member having an aperture substantially at the center thereof, and a disc shaped packing member associated with both of said tubes and having one

side adjacent to said annular member, the adjacent side of said packing member being adapted to fit against and close the aperture in said annular member to atmosphere when moved in one direction and to move away from and open said aperture to atmosphere when moved in the opposite direction.

19. In a fountain pen, the combination of a barrel, an ink sac, a tube slidable with respect to said barrel, and a button mounted at one end of said tube having means for controlling the air pressure in said tube, said button being rotatably mounted with respect to said tube whereby said button may be rotated without rotating said tube.

20. In a fountain pen, the combination of a barrel, an ink sac, a tube slidable with respect to said barrel, a member rotatably mounted with respect to the tube at one end thereof and a packing in said member adapted to close the end of the tube, said member being rotatable with respect to said tube.

21. In a fountain pen, the combination of a barrel, an ink sac, a tube slidable with respect to said barrel for varying the air pressure effective upon said sac to fill the sac, and a member at the end of said tube adapted to be manually engaged to operate the tube, said member being rotatably mounted with respect to said tube to permit said member to be rotated without rotating said tube.

HENRY J. UPTON.