Dec. 12, 1939. B. CARLISLE 2,183,213

FOUNTAIN PEN

Filed April 13, 1938

Fig. 1.

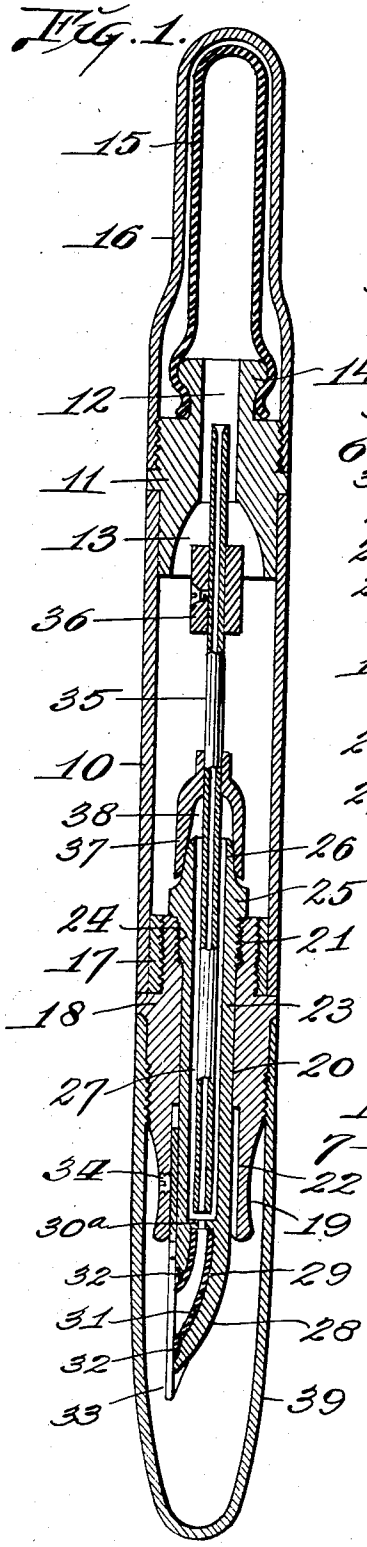


Fig. 2.

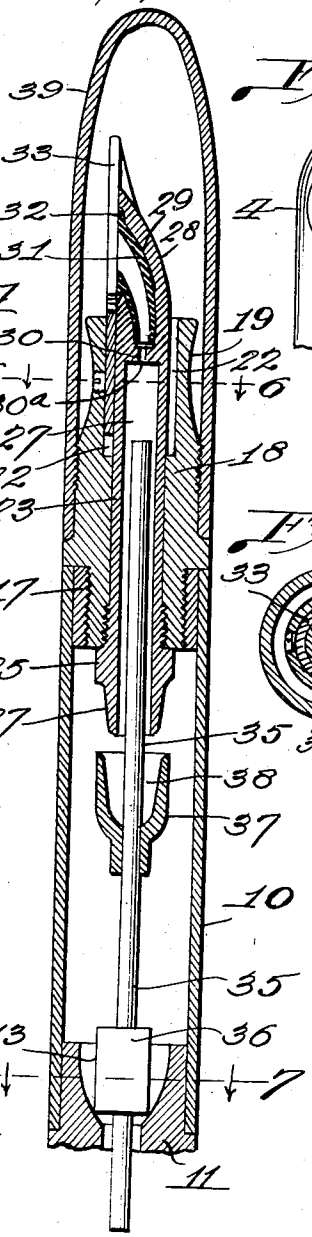


Fig. 3.



Fig. 4.



Fig. 5.

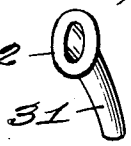


Fig. 6.

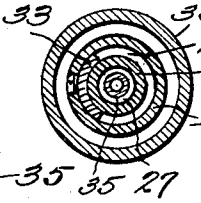


Fig. 7.

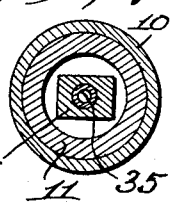
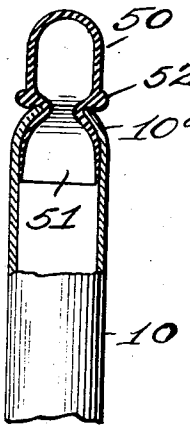


Fig. 8.



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FOUNTAIN PEN

Bert Carlisle, Santa Ana, Calif.

Application April 13, 1938, Serial No. 201,745

7 Claims. (Cl. 120—48)

My invention relates to fountain pens and has for its principal objects, to generally improve upon and simplify the construction of the existing forms of fountain pens, to provide improved means for controlling the flow of ink from the reservoir within the body of the pen to the pen point, to provide improved means including valvular structures for controlling the flow of ink into the body while the reservoir is being filled and also for regulating the flow of ink to the nibs of the pen and which flow involves the phenomena of capillary attraction; and further, to provide means in the form of a gravity actuated longitudinally moving tube for automatically accelerating the flow of ink into the ink chamber that directly supplies the nibs of the pen.

Further objects of my invention, are to provide within the feed chamber of the pen a flexible tubular member composed preferably of rubber which in addition to functioning as a cushion for the pen point that is applied to the stem in which the feed chamber is formed, serves to deliver the supply of ink as used by the pen directly to the slot or channel that is formed between the nibs of the pen.

Further objects of my invention, are to provide simple and efficient means whereby any ink that may remain in the feed chamber within the stem to which the pen point is applied will by suction produced by a gravity actuated member within the pen, be drawn back into the main ink reservoir of the pen, thus minimizing the possibility of leakage of ink from the pen after use and while it occupies an upright position in the pocket or a substantially horizontal position within a hand bag or while lying on the surface of a table or other support.

With the foregoing and other objects in view, my invention consists in certain novel features of construction and arrangement of parts that will be hereinafter more fully described and claimed and illustrated in the accompanying drawing in which:

Fig. 1 is a vertical section taken through the center of a fountain pen constructed in accordance with my invention.

Fig. 2 is a vertical section similar to Fig. 1 and showing the pen in position with the point at the upper end of the pen body.

Fig. 3 is an elevational view of the end of the stem to which the pen point is applied and showing the end of the flexible tube that provides a cushion for the pen point and which conducts the ink directly to the slot between the nibs of the pen.

Fig. 4 is an enlarged cross section taken on the line 4—4 of Fig. 3.

Fig. 5 is a perspective view of the flexible tubular member that is seated in the end of the feed stem.

Fig. 6 is a horizontal section taken on the line 6—6 of Fig. 2.

Fig. 7 is a horizontal section taken on the line 7—7 of Fig. 2.

Fig. 8 is a vertical section taken through the rear or lower end of the pen body and showing a modified form of the flexible bulb that is utilized during the pen refilling operations.

Referring by numerals to the accompanying drawing which illustrates a preferred embodiment of my invention, 10 designates a tubular member that forms the main portion of the body of the pen which member is preferably formed of transparent or semi-transparent material, such as Celluloid, and secured in the rear end of said tubular member is a cylindrical block 11 through which is formed an axial bore 12, the inner portion of which gradually increases in diameter toward the inner end of the block to form a tapered pocket 13.

Projecting from the outer end of the block 11 around the duct therethrough is a short tubular extension 14 which receives the open end of a sack 15 formed of rubber and which is utilized in pen filling operations. When this rubber sack is compressed a substantial portion of the air within the pen is expelled and by immersing the forward end of the pen that carries the pen point in ink or writing fluid, the latter will be drawn into the pen as the sack 15 expands. The internally threaded end of a cap 16 that may be formed of metal, hard rubber or the like, is screw-seated on the externally threaded intermediate portion of block 11.

Secured within the lower or forward end of the tubular body 10, is an internally threaded bushing 17, preferably of metal, and screw-seated therein is the inner end of a substantially cylindrical head 18, the outer portion of which is preferably reduced in diameter as designated by 19. Formed through head 18 is an axial bore 20, the inner portion of which is internally threaded as designated by 21 and the outer portion of said bore is slightly increased in diameter as designated by 22.

Passing through head 18 is a feeder stem 23 having an externally threaded portion 24 that engages the thread 21 in head 18, thus enabling said feeder stem to be readily removed from the head.

That portion of the stem that projects beyond

the end of head 18 into the chamber within the tubular body or barrel 10, is enlarged to form a head 25 and the end of said head terminates in a tapered portion 26.

Formed through head 25 and the greater portion of the body of the feeder stem, is a bore 27 that terminates near the end of the stem that projects beyond the outer end of head 18.

The outer portion of stem 23 extends through the enlarged portion 22 of head 18 and a short distance beyond the end of said head and one side of the projecting portion of said stem is cut away so as to form a curved surface 28.

Formed in the projecting portion of stem 23 and conforming to the curvature of surface 28, is a curved bore 29, the outer end of which communicates with the surface of the stem opposite the intermediate portion of the curved surface 28. A partition 30 is formed between the end of bore 27 and bore 29 and formed through this partition is a small aperture 30*a* that enables ink or writing fluid to pass into and out of the bore 27 that is formed in the feeder stem.

Removably positioned in the curved bore 29, is a tube 31 preferably formed of rubber and formed integral with the outer end thereof is an outwardly presented flange 32 that overlies the external surface of the feeder stem 23 immediately adjacent the outer end of the bore 29. This flange provides an elastic packing for those portions of the nibs of a conventional pen point 33, which latter overlies the projecting portion of stem 23 on the opposite side from the curved surface 28, and the rear portion of said pen point extends into the enlarged portion 22 of bore 20 and is clamped to the stem by a set screw 34 that is seated in the reduced end portion 19 of head 18.

The construction just described enables the pen point to be secured in properly adjusted position upon the feeder stem 23 with the nibs of said pen point overlying the cushion provided by the flanged outer end of tube 31 and with the slot between the nibs extending across the outer end of the duct through tubular member 31.

I prefer to form the elastic tubular member 31 tapered throughout its length, so that it gradually increases in diameter toward the flange 32 although such construction is not absolutely necessary to the proper functioning of the tube which conducts ink from the bore 27 in feeder stem 23 to the nibs of the pin point.

Arranged to slide freely lengthwise through the tubular body 10 and disposed axially therein is a small tube 35, the length of which is such that one end always extends into and partially through the bore 12 in head 11 and the opposite portion extends into and partially through the bore 27 in the feeder stem.

Secured in any suitable manner on that portion of the tube that extends into head 11, is a block 36 that is non-circular in cross section and which functions as a stop to limit the downward movement of the tube 35 when the pen is held in an upright position with the pen point uppermost as illustrated in Fig. 2. This stop block 36 is adapted to enter the enlarged inner end 13 of the bore 12 and rest on the surface thereof as illustrated in Fig. 2 when the pen is in a substantially upright position with the pen point uppermost, and under such conditions ink or writing fluid is free to flow by gravity from the chamber within the tubular body 10 downwardly through bore 12 into the collapsible sack 15.

Secured in any suitable manner to the intermediate portion of tube 35 is a bell-shaped cap 37, the chamber 38 within which is tapered so that it will snugly receive the tapered projecting portion 26 of head 25 when the pen is held in a substantially upright position with the pen point at the lower end. Under such conditions, the member 37 functions as a valve to effectually cut off communication between the chamber within the tubular body 10 and the bore 27 in feeder stem 23.

A cap 39 is removably positioned on head 18 and provides a protective cover for the projecting end of the feeder stem 18 and the pen point that overlies same while the pen is not in use.

In order to fill my improved fountain pen, caps 16 and 39 are removed and with the pen held in a substantially upright position the projecting end of the feeder stem 23 and the overlying nibs of the pen point are immerged in an ink or writing fluid container.

Inasmuch as the pen is held in a substantially upright position, the tube 35 will by gravity move to its lowest limit of movement and in so doing the stop block 36 will move downward away from the surface of the tapered portion 13 of bore 12 and the valvular member 37 will fit snugly over the tapered projecting portion 26 of head 25.

As collapsible bulb 15 is squeezed, a substantial amount of the air within the various chambers within the pen will be expelled outwardly through the elastic tube 31 that communicates with the slot between the nibs of the pen, and as the collapsed bulb is permitted to return to its normal condition ink or writing fluid will be drawn from the container upwardly through tube 31, thence through aperture 30*a* into bore 27, the upper end of which is closed by valvular member 37 and the ink thus drawn into the pen will pass lengthwise through tube 35 and discharge from the upper end thereof into the chamber within the tubular body 10. Thus by intermittently collapsing sack 15 a substantial supply of ink may be drawn into the chamber or reservoir within the tubular body of the pen.

While using the pen, the same is held by the thumb and fingers in an inclined position with the pen point lower than the upper end of the pen that carries the collapsible sack 15 and as the points of the nibs pass over the paper, ink or writing fluid will flow from the chamber formed by bore 27 in the feeder stem and this ink as used passes through aperture 30*a*, and thence through elastic tube 31 into the slot between the nibs of the pen point. During use of the pen under such conditions, the weight of the tube 35 and parts carried thereby maintain valvular member 37 in position on the tapered end 26 of head 25, so that the weight of the supply of ink or writing fluid in the reservoir within tubular body 10 is prevented from acting upon the ink within the bore 27 below valvular member 37 and thus over-feed of ink to the pen point while the pen is in use is effectually prevented.

In the event that the pen is used to such an extent as to exhaust the supply of ink contained in bore 27 below valvular member 37, it is only necessary for the user of the pen to reverse the position of said pen or move the same into such inclined position with the pen point uppermost so as to cause the tube 35 to move by gravity downward until block 36 engages the surface of the enlarged end 13 of bore 12 and such movement carries valvular member 37 away from the tapered end of head 25. The pen is now shifted back to its normal or writing position with the

pen point at the lower end and before the rod 35 moves downwardly through the pen to reposition valvular member 37 on head 25, a sufficient amount of ink will enter bore 27 to fill the same and thus the supply of ink within the feeder stem is replenished.

In connection with the operations just described, it will be understood that tube 35 carrying block 36 and member 37 which add weight to said tube, does not move lengthwise until after the pen has moved into an angular position of several degrees past horizontal and as result, the ink or fluid will flow into and out of the reservoir within the tubular body 10 before the tube moves lengthwise, so as to position valvular member 37 on the tubular extension of head 25.

When the pen is carried in the pocket or in a substantially upright position as illustrated in Fig. 1, the weight of the tube 35 and parts carried thereby maintain said tube at its lower limit of movement with block 36 resting on head 11 and with valvular member 37 a short distance below the tapered extension of head 25. When so positioned, ink or fluid may flow by gravity from the chamber within tubular body 10 downwardly through bore 12, so as to fill the latter and also fill the collapsible tube 15 that is carried by the lower end of the pen body. While in such position, all ink or fluid will drain downwardly from tube 31 and duct 27 and a small amount of ink or fluid will be retained in the bell-shaped valvular member 37 and this small amount of ink will when the position of the pen is reversed, pass through bore 27 and tube 31 to prime the pen point at the beginning of the subsequent writing functions.

While the pen is not in use and occupies a substantially horizontal position; for instance, in a hand bag or in a rack on a desk or table, the valvular member 37 occupies a position so as to close the end of the duct 27 through feeder stem and thus the weight of any ink within the main reservoir of the pen is prevented from acting on the relatively small amount of ink that is retained in the duct 27.

Even though the pen should be carried in the pocket or a hand bag with the pen point at the lower end of the pen, leakage of the ink from the pen will be prevented by the capillary attraction prevailing within the rubber tube 31 and the small aperture 30*a* in partition 30. This preventing of leakage is enhanced by the capillary attraction and surface tension prevailing between the relatively small amount of ink that is contained in the angular chamber between the lower portion of tube 35 and the feeder stem 23 and which last mentioned ink is not subjected to pressure of the relatively large body of ink within the reservoir in tubular body 10.

In this connection it should be understood that the diameter of bore 27 is only a slight degree greater than the diameter of tube 35 and as the bore 27 is of considerable length, a substantial degree of capillary attraction and surface tension is produced in the bore around that portion of the tube that projects therein.

An especially important feature of my invention is the rubber tube 31 that is seated in the end of feeder stem 23, for such tube in addition to controlling flow of ink to the nibs of the pen and preventing overflow by reason of capillary attraction and surface tension, is provided with a flanged outer end that serves as a cushion for the overlying nibs of the pen to cause said pen to function freely and without the development of the stiffness or inflexibility that is tiresome to the user of the pen.

In Fig. 8 I have illustrated a modified form of the collapsible sack or bulb that is carried by the upper or rear end of the tubular body 10. In this construction, the upper end of the tubular body 10 is flanged or curved inwardly as designed by 10*a* and removably applied to said end is a bulb 50 provided at its open end with an outwardly curved skirt portion 51 that enters the contracted end 10*a* of tube 10 and there being an external rib or flange 52 formed on said bulb immediately adjacent the skirt portion 51.

This rib overlies the end of the inwardly curved portion 10*a* of the tubular body and it also serves as a stop for the end of the cap that is removably applied to the bulb as a protective cover.

Thus it will be seen that I have provided a fountain pen that is relatively simple in construction, inexpensive of manufacture and very effective in performing the function for which it is intended.

It will be understood that minor changes in the size, form and construction of the various parts of my improved fountain pen, may be made and substituted for those herein shown and described, without departing from the spirit of my invention, the scope of which is set forth in the appended claims.

I claim as my invention:

1. In a fountain pen, a body provided with an ink reservoir, a tubular feeder stem projecting from one end of said body, a pen point positioned upon the projecting end of said feeder stem, a gravity actuated tube arranged for longitudinal movement within the pen body and extending into said tubular feeder stem and valvular means carried by said tube and adapted to close the end of the feeder stem that communicates with the ink reservoir in the body of the pen.

2. In a fountain pen, a body provided with an ink reservoir, a tubular feeder stem projecting from one end of said body, a pen point positioned upon the projecting end of said feeder stem, a gravity actuated tube arranged for longitudinal movement within the pen body and extending into said tubular feeder stem, valvular means carried by said tube and adapted to close the end of the feeder stem that communicates with the ink reservoir in the body of the pen and means adjustably mounted on said gravity actuated tube for limiting the movement thereof through the body of the pen away from said feeder stem.

3. In a fountain pen, a body having a reservoir, a tubular feeder stem projecting from one end of said body, a pen point secured in position on the projecting end of said feeder stem, the inner end of said feeder stem having communication with the reservoir in the pen body, a gravity actuated tube extending lengthwise within the pen body and extending into said tubular feeder stem and co-operating valvular means on the inner end of said tubular feeder stem and said gravity actuated tube for controlling the flow of ink from the reservoir into said feeder stem.

4. A fountain pen as set forth in claim 3 with a collapsible sack secured to the end of the pen body opposite the end in which the feeder stem is seated.

5. In a fountain pen, a body having a reservoir, a tubular feeder stem projecting from one end of said body, a pen point secured in position on the projecting end of said feeder stem, the inner end of said feeder stem having communication with the reservoir in the pen body, a gravity actuated

tube arranged for lengthwise movement within the pen body, a valve seat at the inner end of said tubular feeder stem and a cup-shaped valve carried by said tubular member and adapted to rest on said valve seat for closing the inner end of said feeder stem.

6. In a fountain pen, a body having an ink reservoir, a tubular feeder stem removably seated in and projecting from one end of said body, a pen point seated in the projecting end of said feeder stem, a tubular plug closing the other end of said body, a collapsible sack carried by said tubular plug, a gravity actuated tube arranged to slide freely within said body, one end of which tube is positioned in the tubular feeder stem, the other end being positioned in the tubular plug, a valve seat formed on the inner end of the feeder stem and a valve carried by said tube for engaging said valve seat to cut off flow of fluid from the reservoir into and through said feeder stem.

7. A fountain pen as set forth in claim 6, with a weight adjustably mounted on said tube and adapted to engage the inner end of the tubular plug in said body for limiting the sliding movement of the tube and the valve carried thereby away from said valve seat.

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