Jan. 1, 1935. J. C. SHERMAN 1,986,372

FOUNTAIN PEN

Filed Aug. 26, 1933

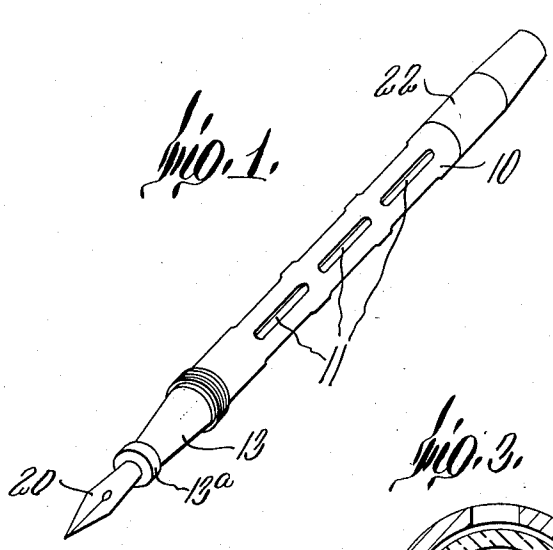

Fig. 1.

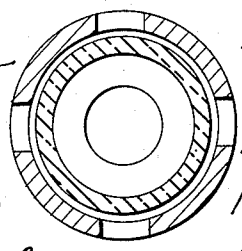

Fig. 3.

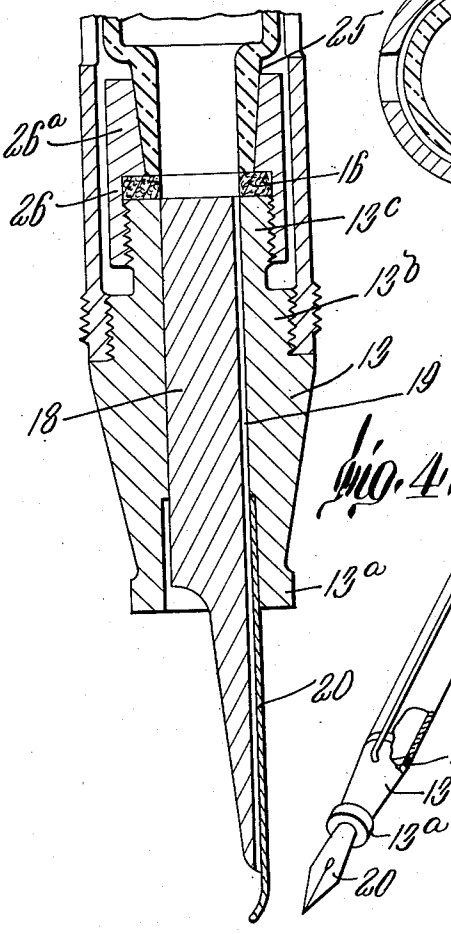

Fig. 4.

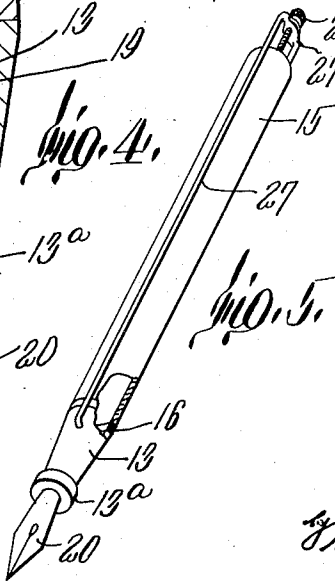

Fig. 5.

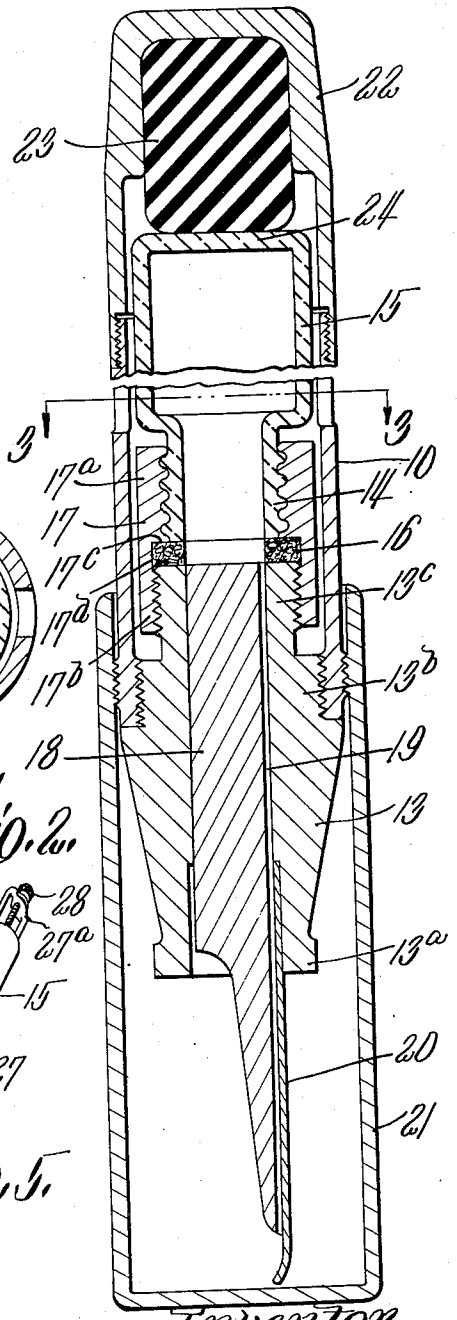

Fig. 2.

Inventor
John C. Sherman
by Wright, Brown, Quinby & May
Attys

Patented Jan. 1, 1935 1,986,372

UNITED STATES PATENT OFFICE

1,986,372

FOUNTAIN PEN

John C. Sherman, Gorham, Maine

Application August 26, 1933, Serial No. 686,957

3 Claims. (Cl. 120—42)

The purpose of this invention is to use an ink bottle as an ink supply in a fountain pen so that the bottle may form part of the pen assembly until the ink contained therein is exhausted, whereupon the bottle may be discarded and replaced by a filled duplicate. This invention relates in one aspect to a fountain pen which is constructed in such a way as to admit of housing therein of ink-filled containers or vials as part of the pen assembly. The containers or vials may thus be prefilled and sold as the ink supply for the pen much in the same way as are leads for mechanical pencils, so-called.

The well-known type of fountain pen containing therein a rubber tube or sac for holding the ink supply and equipped with a tube-pincher for exhausting the air from the pen so as to permit its re-filling with ink, has the serious fault that the tube loses its resiliency with age and hence soon loses its ability to suck up a long-lasting supply of ink. It is also subject to leakage with deterioration of the rubber tube or sac. The pen of the present invention is designed to overcome such faultiness, to afford the user the opportunity of sighting the ink supply at all times, and to receive a long-lasting supply of ink at each filling.

A preferred embodiment of the pen of the present invention includes the usual cylindrical casing or barrel constituting the holder and the usual cylindrical socket or head into which the feed plug and nib are fitted. In accordance with the present invention, however, the socket or head is extended into the casing for the purpose of being coupled with the necked outlet of an ink vial housed in inverted position in the casing, the end of the necked outlet and the upper end of the socket being forced by a coupling member into leak-proof engagement with a yieldable, ink-impermeable washer disposed in between such ends.

With the foregoing and other features and objects in view, I shall now describe my invention with particular reference to the accompanying drawing, wherein,—

Figure 1 depicts in perspective a pen embodying the present invention.

Figure 2 represents a central longitudinal section, partly broken away, of such a pen.

Figure 3 is a horizontal section on the line 3—3 of Figure 2.

Figure 4 represents a longitudinal section through the head portion of a modification.

Figure 5 illustrates in perspective another embodiment of my invention wherein the usual casing or barrel is omitted.

As already indicated, the pen of my invention may include a cylindrical casing or barrel 10 constituting the holder. This part may be molded from any suitable plastic material as heretofore, although it may be advantageously shaped from sheet aluminum or like metal which lends itself well to the punching of rows of longitudinal sight openings 11 through the wall of the casing. An open-ended cylindrical socket or head 13 of gradually diminishing external taper toward its lower end portion 13*a*, which may be squared off as usual, has a central portion 13*b* of reduced external diameter in threaded engagement with the interior lower end wall of the casing 10 and an upper end portion or extension 13*c* of still more reduced external diameter projecting upwardly into the casing so as to form an annular clearance with the internal wall of the casing. The extension 13*c* may be threaded on its exterior and thus serve as a nipple to be coupled with the neck 14 of a cylindrical ink container or vial 15 housed in inverted position within the casing 10, as shown in Figure 2, a washer or gasket 16 is inserted between the end of the neck 14 and the end of the extension 13*c*. The washer may be made of yieldable, ink-impermeable material, e. g., waterproofed fiberboard, rubber, etc., so as to serve as an effective seal when the end of the neck 14 and the end of the extension 13*c* are caused to bite thereinto under the action of a tubular coupling 17 whose upper portion 17*a* is in threaded engagement with the neck and whose lower portion 17*b* is in threaded engagement with the extension. The coupling is preferably provided at the region where the threaded upper portion leaves off with an inwardly projecting shoulder 17*c* which is flush with the end of the neck 14 and which is adapted to bear down on the washer 16 so as to seal the end of the neck and the end of the extension 13*c* more effectively against leakage. The coupling wall 17*d* between the threaded upper and lower portions is preferably left smooth so as to permit a nice fit of the washer 16 thereagainst.

The bore in the socket 13, which is shown as being of uniform diameter throughout, is adapted to receive tightly therein the usual cylindrical plug 18 having an ink-feeding channel 19 leading to a nib 20 held in place in the socket by the plug. A tubular cap or closure 21 may be provided as customarily for threaded engagement with the lower end portion of the casing 10. The upper end portion of the casing 10 is also provided with a tubular cap or closure 22 whose lower end portion can be screwed onto the casing so as to complete the enclosure or housing of the vial 15. In order that no accidental loosening of the vial and leaking of ink may take place as a result of dropping the pen or other vibration or abuse in service, a resilient packing material 23, for instance, a block of rubber, is preferably anchored in the cap 22 so that when the cap is screwed home, the

block presses firmly against the bottom 24 of the vial so as to afford resistance against the dislodgment of the vial under vibration.

The vial 15 may be made of any suitable transparent or translucent material, conveniently glass, although translucent celluloid or similar comparatively non-frangible and yieldable material may be used. When such latter material or even when glass is used, the necked outlet may have a smooth exterior 25 of gradually diminishing taper toward its end, as shown in Figure 4, and the coupling 26 used therewith may have a complemental interior taper at its upper end portion 26*a*, wherefore, when the necked outlet is inserted in the portion 26*a* and the coupling is screwed down tightly, the mating tapered surfaces are brought tightly together, making a leak-proof joint. In other respects, this form of pen assembly may be like that shown in Figure 2.

In filling the pen, the pen is held with its point up and the cap 22 is unscrewed from the casing 10, whereupon the vial 15 is unscrewed from the member 17 and withdrawn downwardly from the casing. A filled but unstoppered vial is inserted upwardly into the casing and screwed to the member 17. The cap 22 is finally screwed onto the casing so as to bring the resilient packing material into tight contact with the bottom of the vial 15.

The diameter of the vial is preferably such as to leave a clearance or annular free space in the casing, thereby avoiding any danger of crushing the vial as well as providing an air space which acts to insulate the vial and its ink content against the attainment of body heat such as tends to accelerate the flow of ink to the pen-point and dripping of ink or ink-flooding. The openings in the casing not only permit sight of the ink supply in the vial, but also permit the escape of such heated air as may accumulate in the air space when the pen is kept in a pocket next to the body. Commercial glass vials are apt to vary slightly in length. The preferred material for the packing element 23 is rubber which is relatively incompressible and which, upon being squeezed down on the bottom of the vial, can be displaced or caused to spread into the free space in the casing to a greater or less degree as the length of vial may require.

According to another embodiment of my invention shown in Figure 5, the barrel is omitted and the ink vial 15 is pressed into ink-tight union with the other parts including the socket 13 and the washer 16 which constitutes the ink-sealing means into which the open or outlet end of the vial and the upper end of the socket are caused to bite by suitable clamping means. The clamping means may, as shown, include a U-shaped yoke 27 of stout wire whose legs are pivotally secured at their end portions in the wall of the socket 13 and whose bridge portion 27*a* extends across the bottom of the vial and has a clamping screw 28 threaded therethrough with its end engaging firmly against the bottom of the vial. The legs of the yoke may, if desired, fit into grooves formed in the side walls of the bottle so that the bottle may present a substantially smooth or uninterrupted handle. It is to be observed that the socket 16 need not in such case be provided with screw-threaded portions 13*b* and 13*c*. Although such a pen assembly represents the simplest embodiment of my invention, wherein the ink bottle constitutes the holder or handle, nevertheless the bottle and its contents are exposed directly to body heat.

It is possible for those skilled in the art to resort to other changes and modifications of the pen assembly embodying the present invention without departing from the principles of my invention as defined in the appended claims.

I claim:—

1. In a fountain pen, the combination with a cylindrical casing constituting the holder, an open-ended tubular socket engaging the lower end portion of said casing and having an upper portion of reduced diameter projecting into said casing, a plug having an ink-feeding channel fitted into said socket, and a nib held in said socket by said plug and receiving the ink flowing through said channel, of an ink container within said casing having a necked outlet whose end is adjacent to the upper end of said socket, a yieldable, ink-impermeable washer disposed in between said adjacent ends, and means for forcing said adjacent ends into leak-proof engagement with said washer.

2. In a fountain pen, the combination with a cylindrical casing constituting the holder, an open-ended tubular socket engaging the lower end portion of said casing and having an upper portion of reduced diameter projecting into said casing, a plug having an ink-feeding channel fitted into said socket, and a nib held in said socket by said plug and receiving the ink flowing through said channel, of a transparent ink vial within said casing having a necked outlet whose end is adjacent to the upper end of said socket, a yieldable, ink-impermeable washer disposed in between said adjacent ends, and a tubular coupling having an upper portion in threaded engagement with said necked outlet and a lower portion in threaded engagement with the upper portion of said socket and holding said necked outlet end and said upper socket end pressed into leak-proof engagement with said washer, said cylindrical casing having openings therethrough permitting sight of the ink supply in said transparent vial.

3. In a fountain pen, the combination with a cylindrical casing constituting the holder, an open-ended tubular socket engaging the lower end portion of said casing and having an upper portion of reduced diameter projecting into said casing, a plug having an ink-feeding channel fitted into said socket, and a nib held in said socket by said plug and receiving the ink flowing through said channel, of a transparent ink vial within said casing having a necked outlet whose end is adjacent to the upper end of said socket, a yieldable, ink-impermeable washer disposed in between said adjacent ends, a tubular coupling having an upper portion in threaded engagement with said necked outlet and a lower portion in threaded engagement with the upper portion of said socket and holding said necked outlet end and said upper socket end pressed into leak-proof engagement with said washer, and means affording resistance against the dislodgement of said vial under vibration, said cylindrical casing having openings therethrough permitting sight of the ink supply in said transparent vial.

JOHN C. SHERMAN.