

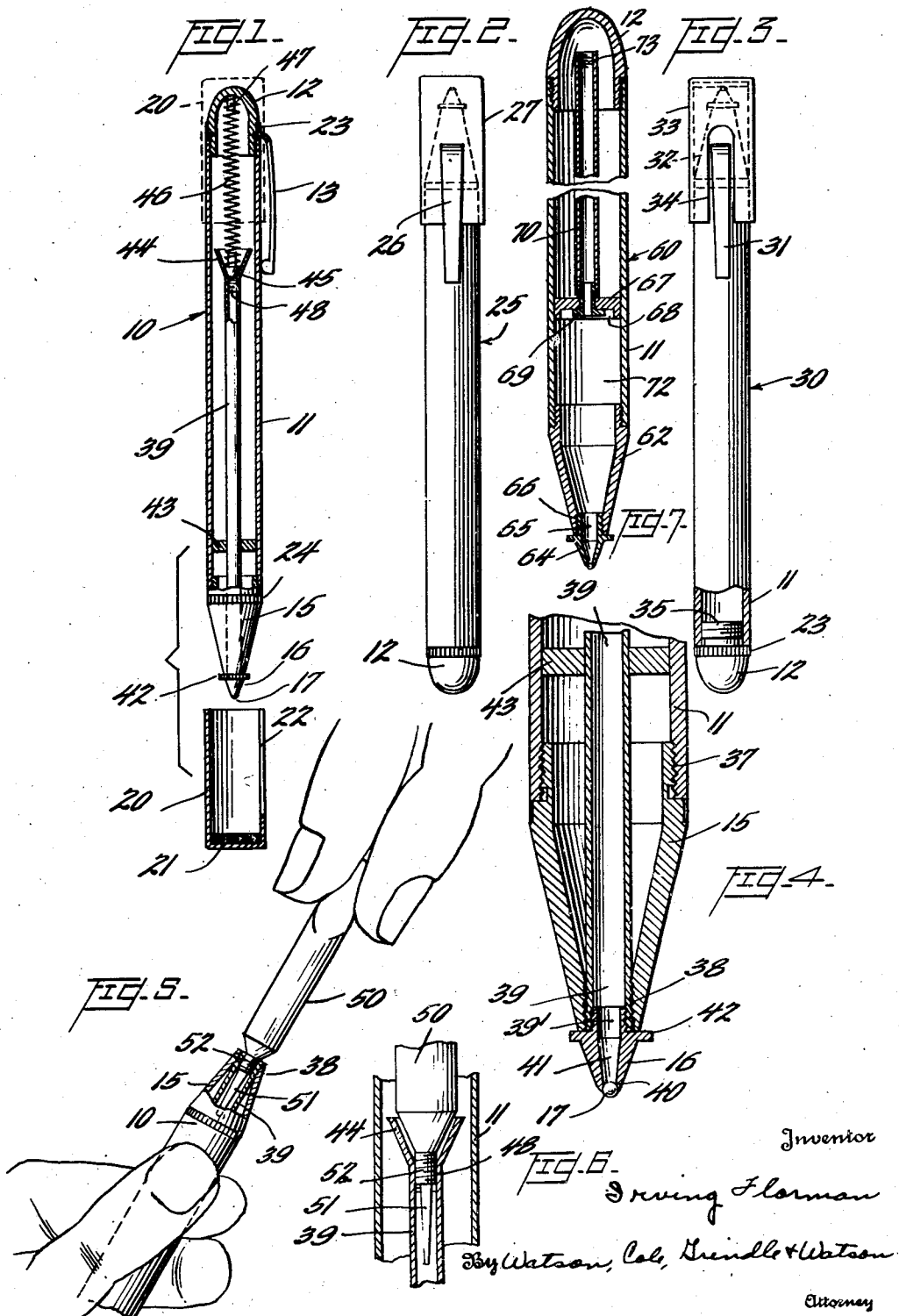
Sept. 24, 1946.

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2,408,256

FILLING ARRANGEMENT FOR BALL-POINTED FOUNTAIN PENS

Filed April 5, 1946



UNITED STATES PATENT OFFICE

2,408,256

FILLING ARRANGEMENT FOR BALL-
POINTED FOUNTAIN PENS

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Application April 5, 1946, Serial No. 659,907

2 Claims. (Cl. 226—63)

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This invention relates to writing implements and the like, and more particularly to fountain pens having ball points and utilizing pasty or viscous writing fluid.

Pens of this general description have been on the market for some time but they have exhibited certain objectionable features, and it is one of the objects of the present invention to obviate those deficiencies. The ink employed in this type of pen is intended to last for a long period of time before recharging, and in most cases the pens must be returned to the dealer or sent back to the factory to be recharged. The ink contains a pigment or dye which is very penetrating, and it is difficult to remove the resulting stains, when it comes in contact with the fingers, the clothing, or other objects. In order to prevent soiling or dyeing of the fingers or the clothing of the user, the recharging is effected by the insertion of a separable container or cartridge within the barrel of the pen after the old used cartridge is removed, but this method entails unnecessarily high initial costs of the pens and the added expense of having them refilled or recharged. On the other hand, to fill the pens through the nib ends by the suction afforded by the rubber sacs as found in the ordinary fountain pens, would be impracticable in view of the high viscosity of the ink.

In view of these considerations, it is an object of the present invention to provide a novel and improved fountain pen using viscous writing fluid, together with novel means for packaging the fluid and injecting it into the pen without danger of overflow, spillage, or soiling of the fingers or clothes. The novel means and method of supplying the pen with writing fluid are available to the user of the pen and the invention dispenses with the necessity of returning the pen to the manufacturer for recharging, or for the expensive provision of renewable cartridges for insertion in the pens.

In its preferred embodiment, the invention contemplates the provision of a fountain pen or writing implement having a fine ball point which is supplied with a film of writing fluid through the clearances of the ball and its socket in the point end of the pen. The point end of the implement is preferably tapered and the extreme tip of the tapered end comprises a separable closure which is attached to the main body portion preferably by means of screw threads. The remainder of the tapered portion of the pen may also be threaded to the cylindrical barrel which constitutes or encloses the main reservoir for

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the writing fluid. Preferably, a separable closure is provided for the opposite or shank end of the barrel.

In the preferred embodiments of the invention, the ball point carrying closure tip of the pen has a rearwardly extending tubular portion externally threaded to fit within the internal threads provided within the mouth of the tapered forward end of the pen proper. The writing fluid is supplied in flexible-walled collapsible tubes of the general type commonly employed for dispensing tooth paste, adhesives, or the like. These tubes preferably comprise the original sales package of the ink or writing fluid. The nozzle or dispensing end of the tube is provided with an elongated fine pointed extension of a size readily insertable into the rather small opening in the tapered end of the pen which is adapted to receive the pen point carrying closure. The shank of the nozzle of the dispensing tube is shouldered and provided with a threaded portion corresponding in size and pitch with the threads on the ball point carrying closure tip of the pen. Consequently, when it is desired to recharge the pen with writing fluid the closure tip is unscrewed and the nozzle of the dispensing tube inserted within the opening in the tapered end of the body of the pen and the threaded portion of the nozzle screwed into position. Then the body of the collapsible tube is squeezed until a charge of writing fluid is forced into the barrel of the pen, whereupon the dispensing tube is unscrewed and removed, and the threaded tip replaced, all without leakage of writing fluid.

Another object of the invention is the provision of a fountain pen of this general type in which certain novel mixing means are provided whereby the writing fluid may be maintained as a homogeneous solution or emulsion.

Another object is the provision of means for filling a reservoir within the pen with writing fluid, not only from the forward end as already suggested, but from the rear end of such reservoir, and by means of the same leak-proof method as in the earlier described manipulation.

Other objects and features of novelty will be apparent from the following specification when read in connection with the accompanying drawing in which certain embodiments of the invention are illustrated by way of example.

In the drawing:

Figure 1 is an exploded view, mainly in vertical section, of a fountain pen embodying the principles of the invention, the pen having a retaining clip applied to its shank end and also pro-

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vided with a removable cap, the cap being shown in broken lines as applied to the shank end, and in vertical section in position for application to the point end of the pen;

Figure 2 is a view in side elevation of another embodiment of the invention in which the clip is applied to the cap as in the ordinary well known type of fountain pen;

Figure 3 is a similar view of a further modification in which the clip is secured to the tapered point end of the pen, the opposite end of the pen being shown in section in this view;

Figure 4 is an enlarged sectional view of the point end of the pen illustrated in Fig. 1 showing the threaded connections of the separable parts;

Figure 5 is a view mainly in perspective, showing the manner of filling the point end of the pen illustrated in Figure 1, and Figure 6 is a fragmentary sectional view showing the alternative manner of filling the pen of Figure 1 from its rear end. It is to be understood that these showings are by way of example only and that the use, as a method of filling, of a screw-threaded nozzle on a container for the viscous material and cooperating screw threads on the filling opening of a fountain pen is generic to all of the embodiments of fountain pen disclosed in this application.

Figure 7 is a view in vertical longitudinal section of still another embodiment of the invention.

The pen shown in Figure 1 of the drawing is indicated generally by the reference numeral 10 and comprises a barrel portion 11 which is of a generally cylindrical configuration. An end closure 12 is applied to the shank end of the barrel 11 and serves to secure the retaining clip 13 adjacent the shank end of the implement.

At the forward or writing end of the pen there is provided a tapered portion 15 which is preferably threaded into the end of the barrel 11 and carries a conical tip 16 which supports the ball point 17 which bears upon the paper and dispenses the writing fluid during the writing operation. The tip 16 is in the form of a closure which is detachably secured to the tapered portion 15 of the pen as will be later described.

A protective cap 20 may be used with the pen 10 in order to protect the point 17 when the pen is not in use. The cap is of a generally cylindrical contour and is provided within the closed end with a disk or pad 21 which provides a resilient cushion or shock absorber for the point 17. The cushion 21 may be made of sponge rubber or other suitable material and not only protects the point from shock but also shields it from contact with other objects and materials so that the latter may not be soiled by the ink on the point 17. When the pen is being used, the cap 20 is applied to the shank end of the pen and a slot 22 is provided in the wall of the cap to accommodate the clip 13.

Both the shank end closure 12 and the tapered point section 15 are provided with knurled rings 23 and 24 respectively. These knurled portions not only aid in screwing the closures or tips onto the barrel but also provide frictional means for contacting the interior of the protecting cap 20 and retaining the cap in place when it is applied to either end of the pen.

In Figure 2 of the drawing, a second embodiment of the invention is indicated at 25 and is similar in all respects to the pen 10 with the exception of the provision of the clip 26 upon the cap 27, instead of on the pen itself. This method

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of disposing the supporting clip is conventional in most old style fountain pens now in use.

The pen 30 shown in Figure 3 of the drawing differs from the other two embodiments, in that the clip 31 is secured to the tapered end portion 32 of the pen, and the cap 33 which is used to protect the point is slotted as at 34 to accommodate the clip 31 when the former is applied to the point end of the pen.

In the case of the pen 10 shown in Figure 1, the implement is intended to be disposed in the pocket of the user with the point downward, whereas in the cases of the pens 25 and 30 in Figures 2 and 3 of the drawing, the pens are disposed point upwards when clipped to the pocket.

As shown clearly in the lower portion of Figure 3 of the drawing, the shank end closure 12 of the pen is provided with a plug portion 35 which is threaded into the threaded end of the barrel 11.

The enlarged view comprising Figure 4 of the drawing shows the threaded connection 37 between the barrel 11 and the tapered barrel extension 15 of the pen. The forward or reduced end of the tapered portion 15 is internally threaded as at 38 to receive the externally threaded elongated ink tube 39. This tube is also internally threaded to receive the thread nipple 39' of the point-carrying tip 16. The point 17 comprises a tiny sphere or ball which is rotatably fitted within the socket 40 provided within the tapered passageway 41 of the tip or closure 16. Also the intermediate portion of closure 16 is provided with a knurled flange 42.

From the point end of the pen, the axially disposed ink containing tube 39 extends rearwardly beyond the mid-point of the pen barrel 11 as clearly shown in Figure 1 of the drawing. A bushing or plug 43 provides a centering and supporting partition in the forward end of the barrel whereby tube 39 is rigidly supported for permanent installation within the pen barrel.

The tube 39 is provided with a flared or funnel shaped rear end 44, the rim of the funnel shaped portion being spaced a very slight distance from the inner wall of the barrel 11, say approximately $\frac{1}{2}$ of an inch.

There is seated in the neck of the funnel portion at the end of the cylindrical portion of the tube 39, a closure plug or valve 45 which is secured to the forward end of the coil spring element 46, the rear end of which is attached to the projection 47 within the end closure 12. It will be understood that when the end closure 12 is screwed into the rear end of the barrel, the plug 45 will be pressed into place at the end of the tube 39 by the compression of the spring element 46. Thus the inner reservoir 39 may be segregated from the interior of the barrel 11, and the former may be employed as the sole writing fluid reservoir; or it may be supplemented by the outer reservoir formed by the barrel 11 itself, and writing fluid admitted from time to time as needed to the inner tube 39 by the removal of the block 45.

In cases where the entire interior of the pen is to be used as a container or reservoir for writing fluid, the plug 45 and spring 46 may be removed, and in such cases the funnel shaped portion 44 of the inner tube serves as a mixing vane, whereby the ink or viscous writing fluid may be rendered homogeneous as it flows to and fro past the funnel shaped enlargement 44. The pen may be shaken in order to effect this mixing, or the mere natural flow during handling of the pen may suffice.

When the inner tube 39 is employed as the sole

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reservoir for the ink, it may be filled from either end, as will be described.

In Figure 5 of the drawing, there is illustrated a safe and clean method of recharging the pen with the viscous ink. The pen is seized in one hand, and the removable tip 16 unscrewed. The user then grasps the collapsible ink containing tube 50 and inserts the tapered attenuated nozzle 51 into the forward end of tube 39 in the section 15. The tube 50 is of the general type employed in dispensing tooth paste, mucilage, and the like, but the nozzle portion is provided with a cylindrical shouldered section 52 at the root of the attenuated portion 51, and the portion 52 is provided externally with threads of the same size and pitch as those on the nipple 39' of the tip 16, so that the portion 52 may be engaged with the threads in the tube 39. This provides a liquid-tight temporary seal so that when the writing fluid is squeezed from the collapsible tube 50 into the tube 39 there is no leakage and no danger of soiling the fingers or clothing.

When sufficient writing fluid has been injected into the pen, the portion 52 is unscrewed from the opening, and the writing tip 16 replaced.

The neck portion adjacent the rear end of the tube 39, just inside of the funnel portion 44 is provided with screw threads 48 of the same size and pitch as the threads upon the interior of the lower end of the tube 39 into which the nipple 39' of the writing tip 16 is screwed. These threads, therefore, are adapted to fit the threads on the shouldered section 52 of the flexible collapsible ink dispensing tube 50. When it is desired to fill the inner reservoir with viscous ink from the rear end of the tube the dispensing package or collapsible tube 50 is applied as clearly shown in Figure 6 of the drawing, the threads on the portion 52 of the tube being screwed into the threaded portion 48 of the reservoir tube 39 and the writing fluid squeezed into the reservoir from the package 50.

In the modification illustrated in Figure 7 of the drawing, the pen 60 comprises the usual hollow tubular barrel portion 11 to the forward end of which is threaded or otherwise secured the tapering point section 62. In this embodiment the tip portion 64 has its nipple 65 screwed into the threaded portion 66 of the reduced opening in the point section 62.

Within the cylindrical portion of the barrel 11, at a predetermined distance from the point section 62 there is fixed a plug or partition 67. The plug 67 is cupped out as at 68 on its forwardly facing surface and is provided centrally with an opening through which a headed tubular member 69 extends. This member 69 is screwed into the threaded forward end of the relatively narrow tubular element 70. By this means the tubular element is rigidly secured to the plug or partition 67 and communicates with the writing fluid reservoir 72 provided forwardly of the partition. The slender tube 70 extends rearwardly of the barrel to a point adjacent the cap on closure 12, where it is accessible from the outside when the closure 12 is removed from the barrel.

The rear end of the tube 70 is threaded as at 73, and these threads are of the same dimen-

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sions as those provided at 66 within the tapered forward portion 62 of the barrel into which is screwed the tip portion 64.

Thus it will be seen that the reservoir 72 for the pasty viscous writing fluid may be filled from either end of the pen by the use of the collapsible original container 50, as in the case of the other embodiments shown. The threaded portion 52 of the nozzle of the tube 50 is screwed into the threaded rear end 73 of the tube 70 after the cap 12 has been removed, or preferably the ink is squeezed into the reservoir by screwing the threaded nozzle 52 into the threaded portion 66 of the part 62, after the removal of the tip 64.

By the means herein described, the recharging of a pen of this type employing the pasty or viscous writing fluid, is made available to the user so that the pen may be refilled or recharged without the necessity of returning it to the manufacturer.

Various changes and modifications may be made in the embodiments illustrated and described herein without departing from the scope of the invention as described by the following claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a filling arrangement for fountain pens of the ball-point stylus type using viscous writing fluid, each having a barrel containing a writing fluid reservoir and terminating in a convergent tapering end portion having a removable ball-point-carrying tip, said arrangement also including a writing fluid package; an axial, internally threaded, relatively small but non-capillary opening in the tapering end portion of the pen into which the ball-point-carrying tip is normally screwed, a radially projecting knurled flange on said tip whereby it may be manually removed from said opening when the reservoir is to be filled, and a nozzle on the package having an externally threaded portion adapted to be screwed into said tip-receiving opening, whereby the viscous writing fluid may be injected into the reservoir in the barrel of the pen without leakage.

2. In a filling arrangement for fountain pens of the ball-point stylus type using viscous writing fluid, each having a barrel containing a writing fluid reservoir and terminating in a convergent tapering end portion having a removable ball-point-carrying tip, said arrangement also including a writing fluid package; an axial, internally threaded, relatively small but non-capillary opening in the tapering end portion of the pen into which the ball-point-carrying tip is normally screwed, a radially projecting knurled flange on said tip whereby it may be manually removed from said opening when the reservoir is to be filled, and a nozzle on the package having a fine tapered injection portion and an externally threaded portion at the base thereof adapted to be screwed into said tip-receiving opening, whereby the viscous writing fluid may be injected well into the reservoir in the barrel of the pen without leakage.

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