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R. J. MANSHEIM  
WRITING INSTRUMENT  
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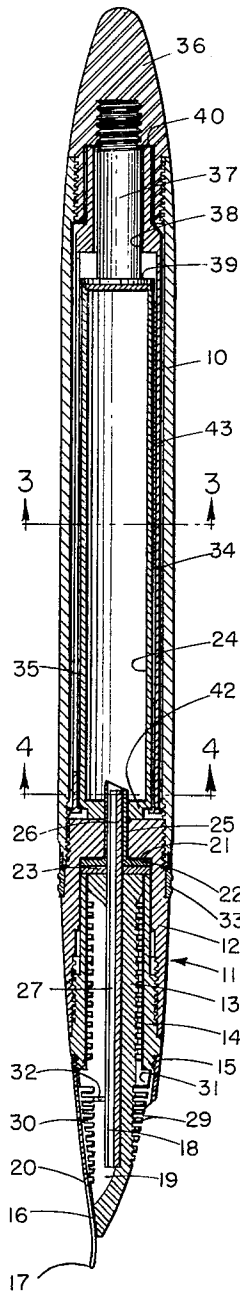


FIG. 1

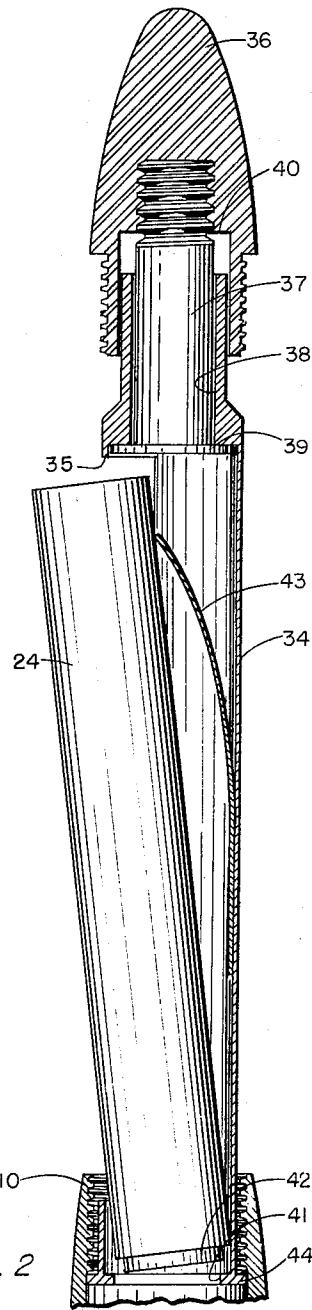
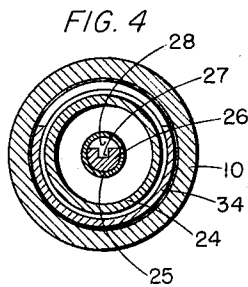
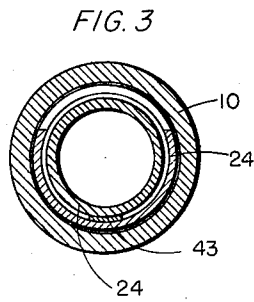


FIG. 2

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WRITING INSTRUMENT

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7 Claims. (Cl. 120—45.4)

This invention relates to writing instruments and has special reference to a writing instrument of the fountain pen type having an extensible carrier member adapted to removably receive a writing fluid cartridge.

More particularly, this invention relates to a fountain pen comprising a barrel having an open end, a writing element extending forwardly of the barrel, and a carrier member telescopically mounted within the barrel and extensible through the open end, there being a writing fluid cartridge carried by the carrier member and removably received therein when the carrier is extended, and means providing fluid communication between the cartridge and the writing element when the carrier is retracted.

When filling the usual type of fountain pen having a lever or plunger actuated filling device disposed internally of the pen barrel, it is normally necessary to completely immerse the entire writing element in a body of writing fluid to insure that a full charge of fluid is drawn into the reservoir and to exclude the inadvertent entry of air thereinto. Thus, a quantity of fluid usually adheres to the writing element and gripping section of the pen after the filling operation, and it is necessary for the user to remove this fluid with a tissue or cloth to prevent it from blotting the writing surface or soiling his hands during subsequent use. Also, to insure proper functioning of the pen immediately after filling, the expansion chambers should be drained of substantially all excess fluid.

Writing fluid is normally obtained by the user in a container or bottle which holds a quantity of fluid sufficient to fill a fountain pen several times. Thus, it is necessary for the user to remove and replace the cap or closure of the container each time that a fountain pen is to be filled, and this requires very careful handling to prevent accidental spillage of fluid. In addition, the usual writing fluid container is made of glass or a similar material and care must be taken, even when the container is closed, to insure against its being dropped or broken.

These problems have long been recognized in the art and various suggestions have been made for their solution. For example, it has been proposed to provide a fountain pen having a removable portion such as the barrel and adapted to receive a disposable cartridge which contains a charge of writing fluid. However, with a pen of this type, sometimes referred to as a cartridge pen, it is necessary to separate the barrel, or a portion thereof, from the writing element. In some instances, the separated portion may be dropped or misplaced, or the threads used to hold it to the balance of the pen might inadvertently be stripped if the user does not carefully align the parts during re-assembly of the pen after inserting a fresh cartridge.

The present invention discloses a fountain pen of the type adapted to receive a disposable writing fluid cartridge, but having an improved means of conveniently inserting and removing the writing fluid cartridge, whereby it is not necessary to dismantle the pen at any time during the filling operation.

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Accordingly, it is one of the objects of this invention to provide a fountain pen which eliminates the necessity of immersing the writing element in a body of fluid during the filling operation, and the need of subsequently removing excess fluid therefrom.

Another object of this invention is to provide a fountain pen which does not require the use of a container holding a larger body of writing fluid than is to be inserted into the pen during the filling operation.

A further object of this invention is the provision of a fountain pen which is adapted to removably receive a substantially unbreakable writing fluid cartridge.

An additional object of this invention is the provision of a fountain pen of the cartridge type which does not have to be dis-assembled during the filling operation.

A still further object of this invention is to provide a fountain pen having a carrier member for removably receiving a writing fluid cartridge, and for positioning the cartridge within the barrel in communication with the writing element.

Another object of this invention is to provide a fountain pen of the cartridge type in which a portion of the writing fluid cartridge is automatically positioned externally of the pen for convenient removal prior to insertion of a fresh cartridge.

A still further object of this invention is the provision of a fountain pen of the cartridge type which requires few parts, which may be simply and ruggedly constructed, which is inexpensive to manufacture, and which may be filled readily, safely and conveniently without undue care on the part of the user.

Further and additional objects of this invention will be apparent from the following description, when taken with the accompanying drawings in which:

Figure 1 is a longitudinal sectional view of a fountain pen embodying this invention;

Fig. 2 is an enlarged fragmentary view of the rearward portion of the embodiment of Figure 1 showing a change in position during the filling operation;

Fig. 3 is a sectional view taken along the line 3—3 of Figure 1; and

Fig. 4 is a sectional view taken along the line 4—4 of Figure 1.

Referring now more particularly to the drawings, the present invention is shown as being embodied in a fountain pen comprising a barrel 10 which is preferably formed of a substantially unbreakable rigid material, such as plastic, having good dimensional stability and a lustrous and long wearing surface. A writing element 11 is threadedly secured to the forward end of the barrel 10 and in axial alignment therewith. The writing element 11 comprises a gripping section 12, a feed bar 13, which may be made of a relatively rigid plastic or rubber material, a point holder 14 and a pen point 15. The pen point 15, in the embodiment shown, is generally conical in configuration and includes an internally threaded portion on its rearward end for engagement with the point holder 14, a capillary slit 16 and a writing tip 17. The feed bar 13 includes a longitudinal bore 18 in communication with a capillary fissure 19 which extends substantially the length of the feed bar to intersect and connect all of the comb cuts 30, which are described in more detail hereinafter. As is well understood in the art, the forward end of the fissure 19 should be positioned adjacent the capillary slit 16 in the pen point 15 to establish the necessary fluid feed path therebetween. The capillary slit 16 terminates adjacent its rearward end in a pierce 20 and is in fluid communication with writing tip 17. The gripping section 12 is secured to barrel 10, and has a forward axial bore adapted to threadedly receive the point holder 14 which carries the feed bar 13 and pen point 15.

The writing fluid reservoir is provided in the form of a sealed cartridge 24 positioned in the barrel 10 and preferably having a pierceable diaphragm on its forward end. To provide fluid communication between the interior of the cartridge 24 and the writing element 11, means comprising a rigid tube 25 is frictionally pushed in an axial bore which extends through the rearward wall of the gripping section 12. The tube 25 has on its forward end an enlarged flange portion 22 which is seated upon a shoulder 21 formed by the axial bores of different diameters in gripping section 12. A centrally apertured gasket 23 formed of resilient non-porous material abuts the flange 22 and, in turn, is abutted by the rearward end of the feed bar 13 and gripping section 12. This provides a fluid tight relationship between the writing element 11 and barrel 10, except through the tube 25 which is tapered on its rearward end for a purpose described hereinafter.

An insert 26 is secured in tube 25 and extends forwardly thereof to adjacent the forward end of the bore 18 in feed bar 13. As can be best seen in Fig. 4, the insert 26 has a fluid feeding channel 27 which provides a passageway from the interior of the cartridge 24 to the capillary fissure 19. The insert 26, which is preferably made of a rubber or plastic material, has a cross section whereby a large air vent 28 is provided to allow entry of air into the reservoir during use of the pen.

During writing, fluid flows from the interior of the cartridge 24 along the fluid feeding channel 27 to the capillary fissure 19 in feed bar 13. From capillary fissure 19 fluid is drawn by capillary attraction to capillary slit 16 in writing element 15 and follows this slit to its forward end, which terminates in the writing tip 17.

An expansion chamber comprising combs 29 and comb cuts 30 is formed in the feed bar 13 in communication with the capillary fissure 19. The annular comb cuts 30 formed around the feed bar are of such dimensions that they will not normally be charged with writing fluid but will retain fluid in the event that atmospheric or temperature conditions cause a discharge from the cartridge 24. As the rearward end of feed bar 13 is held in a substantially air and fluid tight relationship with the bore in the point holder 14, a longitudinal slot 31 of larger than capillary dimensions is provided in the feed bar 13 opposite the capillary fissure 19 to provide a path for the escape of air from the rearward comb cuts as they are filled with fluid in the event of an excess discharge from the cartridge reservoir. A transverse aperture 32, positioned substantially intermediate the ends of the capillary fissure 19, communicates with the atmosphere through one of the comb cuts in feed bar 13 to insure the free passage of air to the reservoir through air vent 28 as fluid is with-drawn therefrom during writing.

Annular ring 33 is secured to the gripping section 12 as a means of frictionally or threadedly receiving and retaining a cap, which is not shown in the drawings.

As pointed out previously in this specification, cartridge type pens have been suggested in the art. However, these suggested pens have presented the disadvantage of having to remove the barrel, or a portion thereof, from the writing element in order to remove or insert a refill cartridge. The part thus removed may easily be dropped or broken or difficulty may be experienced in properly aligning the threads when re-assembling the pen.

The present invention discloses the use of a carrier member 34 which is telescopically mounted within the barrel 10 and longitudinally extensible through the open rearward end thereof. When extended to the position shown in Fig. 2 in the drawings, the carrier member 34 will removably receive the refill cartridge 24 through an aperture 35 which extends longitudinally of the carrier member. An axially slidable grasping element 36 is relatively loosely mounted adjacent the rearward end of the carrier member 34 and is movable thereon between pre-

determined limits. The grasping element preferably should be made of a material similar to that used in the barrel 10 although, of course, it is understood that other types of materials may be used. Also, the grasping element may be provided with a series of annular ridges, indentations or the like, to provide a slip-resistant surface for convenient extension and retraction of the carrier member 34 by the user.

A plunger portion 37 is threadedly or otherwise secured to grasping element 36 and depends downwardly therefrom to project into the carrier member 34 at its rearward end. In the embodiment shown, an axial bore 38 is provided through the rearward end of the carrier member 34 to slidably receive the plunger portion 37 which terminates at its lower end in an enlarged area 39. The enlarged area 39 thus provides a means of limiting the rearward motion of the grasping element 36 and plunger portion 37 relative to the carrier member 34, with the abutment of the shoulder 40 of grasping element 36 and the rearward end of the carrier member 34 limiting the forward motion therebetween.

The lower surface of the plunger portion 37 abuts the rearward end of the cartridge 24 as the carrier member 34 is being retracted within the barrel and impels the cartridge 24 forwardly in the carrier member. During movement of carrier member 34 to the retracted position, a camming action takes place between the cartridge 24 and the rearward edge of the barrel 10 to move the cartridge 24 inwardly and into axial alignment with the pen, as best illustrated in Figure 1. The carrier member 34 is provided with an opening 41 adjacent its forward end to receive a reduced portion 42 of the cartridge 24. This arrangement provides a stop for limiting the forward movement of the cartridge 24 relative to the carrier member 34.

As the carrier member 34 and the cartridge 24 carried therein approach the retracted position, the forward end of the cartridge contacts the upper tapered surface of the tube 25. The cartridge 24 is preferably molded of a relatively resilient and break-resistant plastic. Therefore, as contact pressure between the upper tapered surface of tube 25 and the forward end of cartridge 24 increases, a portion of the forward end of the cartridge will be displaced to allow entry of the tube 25 into the interior of the cartridge 24. As described previously, a series of capillary size fissures and slits provide a means of communicating the cartridge with the writing tip 17.

Although the embodiment disclosed in the appended drawings includes a cartridge adapted to be pierced by a tube, it is understood that various other arrangements may be used.

For the convenience of the user in removing an empty cartridge, a resilient member 43 is provided for urging the cartridge transversely of the carrier member 34 and the aperture 35. As best seen in Fig. 2, the resilient member in this embodiment is secured to the carrier member 34 and normally assumes a position as illustrated. Although this resilient member is preferably a non-corrosive spring metal, other types of materials may be used as it will normally not come into contact with writing fluid.

A transversely extending annular flange 44 is provided adjacent the forward end of the carrier member 34 and is adapted to abut the forwardly facing shoulder formed by the internal threaded area at the rearward end of the pen barrel 10. Thus, the abutment between the flange 44 and the forwardly facing barrel shoulder forms a stop means for limiting the extensible movement of the carrier member 34. This threaded area is also adapted to receive the threaded area of the grasping element 36 to secure the carrier member 34 in the closed position.

After a cartridge has been written dry and it is desired to insert a fresh cartridge into the pen, the user manually rotates the grasping element 36 to disengage

it from the barrel 10, whereafter the grasping element is pulled in a rearward direction to extend the carrier member 34 to the position shown in Fig. 2 in the drawings. In this position, the resilient member 43 urges the upper end of the cartridge 24 transversely of the aperture 35 so that it may readily be removed. The fresh cartridge is then inserted into the carrier member 34 through aperture 35 until it contacts the outwardly extending resilient member 43. The grasping element 36 is then moved downwardly toward the barrel of the pen, which action causes the plunger portion 37, grasping element 36 and enlarged area 39 to move forwardly with respect to the carrier member 34, about the rearward end of the cartridge 24 and impel it forwardly into position. At the same time, a camming action is taking place between the cartridge 24 and the interior of the opening at the rearward end of the barrel to move the cartridge inwardly into axial alignment with the carrier member 34. The grasping element 36 is then threadedly engaged with the barrel 10 to secure the carrier member 34 and effect the final downward movement thereof and of the cartridge 24 which, as described previously, removably receives the tube 25.

As it will be apparent from the foregoing description, a number of modifications could be effected without departing from the scope of this invention. It will be understood, therefore, that the invention is not to be limited to the embodiment disclosed herein, and it is contemplated, by the appended claims, to cover any such modifications as fall within the true spirit and scope of this invention.

I claim:

1. A fountain pen comprising a barrel having an open rearward end, a writing element secured to and extending beyond the forward end of said barrel, a carrier member telescopically mounted within said barrel and having a longitudinal aperture therein, said carrier member being longitudinally extensible through said open rearward end to position said aperture beyond said barrel, a writing fluid cartridge carried by said carrier member, said carrier member removably receiving said cartridge through said aperture when in an extended position, a resilient member secured to and cooperating with said carrier member for urging said cartridge transversely of said aperture, and means providing communication between said cartridge and said writing element when said carrier member is retracted within said barrel.

2. A fountain pen comprising a barrel having an open rearward end, a writing element secured to and extending beyond the forward end of said barrel, a carrier member telescopically mounted within said barrel and having a longitudinal aperture therein, said carrier member being longitudinally extensible through said open rearward end to position said aperture beyond said barrel, a writing fluid cartridge carried by said carrier member, said carrier member removably receiving said cartridge through said aperture when in an extended position, an axially slidable element mounted on said carrier member and movable thereon between predetermined limits for impelling said cartridge forwardly in said carrier member, and means providing communication between said cartridge and said writing element when said carrier member is retracted within said barrel and said cartridge is positioned forwardly in said carrier.

3. A fountain pen comprising a barrel having an open rearward end, a writing element secured to and extending beyond the forward end of said barrel, a carrier member telescopically mounted within said barrel and having a longitudinal aperture therein, said carrier member being longitudinally extensible through said open rearward end to position said aperture beyond said barrel, stop means associated with said barrel and said carrier member for limiting the extensible movement of said carrier when said aperture is positioned beyond said

barrel, a writing fluid cartridge carried by said carrier member, said carrier member removably receiving said cartridge through said aperture when in an extended position, and means for detachably engaging said cartridge for communication therewith and with said writing element when said carrier member is retracted within said barrel.

4. A fountain pen comprising a barrel having an open rearward end, a writing element secured to and extending beyond the forward end of said barrel, a carrier member telescopically mounted within said barrel and having a longitudinal aperture therein, said carrier member being longitudinally extensible through said open rearward end to position said aperture beyond said barrel, a writing fluid cartridge carried by said carrier member, said carrier member removably receiving said cartridge through said aperture when in an extended position, an axially slidable grasping element mounted adjacent the rearward end of said carrier member, a plunger portion carried by said slidable element and projecting into said carrier for impelling said cartridge forwardly therein upon forward axial movement of said slidable element with respect to said carrier member, said slidable element being movable between predetermined limits for extending and retracting said carrier member, and means for detachably engaging said cartridge for communication therewith and with said writing element when said carrier member is retracted within said barrel and said cartridge is positioned forwardly in said carrier.

5. A fountain pen comprising a barrel having an open rearward end, a writing element secured to and extending beyond the forward end of said barrel, a carrier member having an open forward end telescopically mounted within said barrel and having a longitudinal aperture therein, said carrier member being longitudinally extensible through said open rearward end to position said aperture beyond said barrel, a writing fluid cartridge carried by said carrier member, limiting means disposed internally of said carrier member adjacent said open forward end to limit forward movement of said cartridge within said carrier, said carrier member being adapted to removably receive said cartridge through said aperture when in an extended position, and means extending within said open forward end to detachably engage said cartridge, an insert having a fluid passageway disposed in said means providing communication between said cartridge and said writing element when said carrier member is retracted within said barrel.

6. A fountain pen comprising a barrel having an open rearward end, a writing element secured to and extending beyond the forward end of said barrel, a carrier member having an open forward end telescopically mounted within said barrel and having a longitudinal aperture therein, said carrier member being longitudinally extensible through said open rearward end to position said aperture beyond said barrel, stop means associated with said barrel and said carrier member for limiting the extensible movement of said carrier, a writing fluid cartridge carried by said carrier member, limiting means disposed internally of said carrier member adjacent said open forward end to limit forward movement of said cartridge within said carrier, said carrier member removably receiving said cartridge through said aperture when in an extended position, a resilient member secured to and cooperating with said carrier member for urging said cartridge transversely of said aperture, an axially slidable grasping element mounted adjacent the rearward end of said carrier member, a plunger portion carried by said slidable element and projecting into said carrier for impelling said cartridge forwardly therein upon forward axial movement of said slidable element with respect to said carrier member, said slidable element being movable between predetermined limits for extending and retracting said carrier member and means extending within said open forward end to detachably engage said car-

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tridge, an insert having a fluid passageway disposed in said means providing communication between said cartridge and said writing element when said carrier member is retracted within said barrel and said cartridge is positioned forwardly in said carrier.

7. A fountain pen comprising a barrel having an open end, a writing element extending forwardly of said barrel, a carrier member telescopically mounted within said barrel and having a longitudinal aperture in a side wall thereof, said carrier member being longitudinally extensible a predetermined distance through said open end to position said aperture substantially beyond said barrel, a writing fluid cartridge carried by said carrier member, said cartridge being removably received within said car-

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rier through said aperture when said carrier is in an extended position, and means providing fluid communication between said cartridge and said writing element when said carrier member is retracted.

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