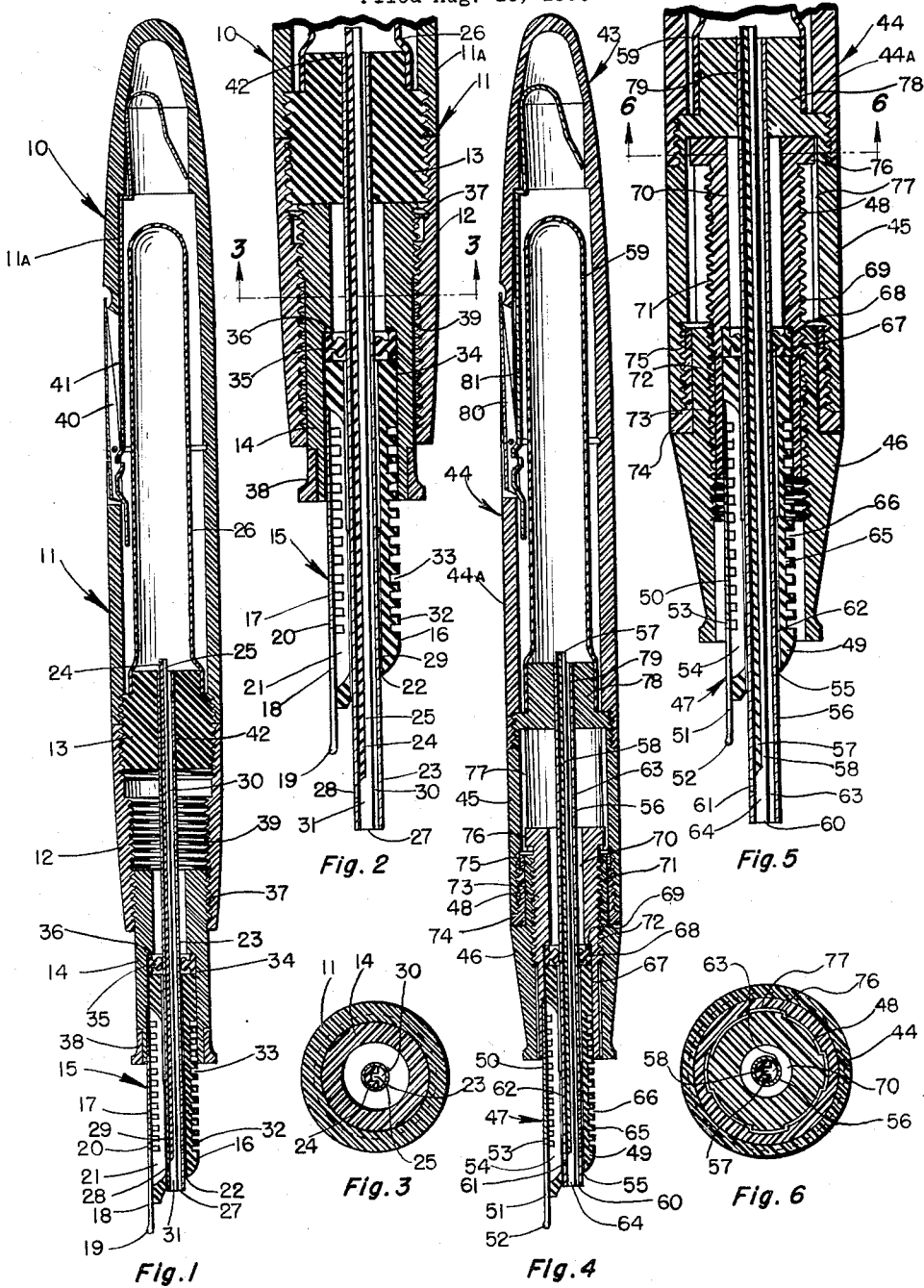


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WRITING INSTRUMENT

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2,935,967

WRITING INSTRUMENT

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This invention relates to writing instruments and has special reference to a writing instrument of the fountain pen type having a filling member positioned beyond the writing element during the filling operation for immersion in a body of writing fluid.

More particularly, this invention relates to a fountain pen comprising a barrel having secured therein a reservoir including a filling member extending forwardly thereof to a position beyond the barrel and having a fluid intake opening at its forward end, there being a writing element mounted on the forward end of the barrel and reciprocal relative to said filling member to a position rearwardly of the fluid intake opening and to position its forward end beyond the fluid intake opening for communication therewith.

In the filling of the usual type of fountain pen with a writing fluid, it is necessary to completely immerse the writing element, which generally includes a feed bar having a plurality of expansion chambers, in the body of fluid during the filling operation to insure that a full charge of fluid is drawn into the reservoir. Thus, when the filling operation is complete, a substantial amount of fluid usually adheres to the writing element and it is generally necessary to remove this residual fluid with a cloth or tissue in order to prevent it from blotting the writing surface or soiling the user's hands during subsequent use of the fountain pen. Also, the excess fluid in the expansion chambers of the feed bar should be removed by blotting to permit the expansion chambers to function properly immediately after filling.

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 fill the reservoir by a separate means extending through the rearward end of the writing instrument barrel to avoid the immersion of the writing element during the filling operation. This proposed solution has met with little if any commercial success because of the complications which arise when attempting to fill the pen by means other than through the forward end.

United States Reissue Patent No. 23,683 dated July 7, 1953, proposes a fountain pen having a filler-needle extensible beyond the writing element for immersion in a body of writing fluid during the filling operation. The present invention discloses a fountain pen of the same generic class, but having an improved means of conditioning the pen for the filling operation, and a minimum number of parts with the attendant manufacturing and maintenance economies.

Accordingly, it is one of the objects of this invention to provide a fountain pen having a filling device which may be operated in such a manner that excess writing fluid will not adhere to the writing element after the filling operation.

Another object of this invention is to provide a fountain pen having a filling device which eliminates the necessity of immersing the writing element in a body of

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fluid during the filling operation, and the need of subsequently wiping excess fluid therefrom.

A further object of this invention is the provision of a filling device which may be adapted to substantially all of the commercial forms of fountain pens now being manufactured.

A still further object of this invention is the provision of a fountain pen having a filling device which requires few parts, which is inexpensive to manufacture and which may be readily operated without undue care on the part of the user.

An additional object of this invention is the provision of a fountain pen having a filling device which normally is concealed and does not interfere with the use of the pen during writing, but which may be conditioned to fill the reservoir by manually rotating the point holder or gripping section with respect to the barrel.

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

Fig. 1 is a longitudinal sectional view of one embodiment of this invention;

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

Fig. 3 is a sectional view taken along the lines 3-3 of Fig. 2;

Fig. 4 is a longitudinal sectional view of a second embodiment of this invention;

Fig. 5 is an enlarged fragmentary view of the forward portion of Fig. 4; and

Fig. 6 is a sectional view taken along the lines 6-6 of Fig. 5.

Referring now to the drawings and more particularly to Figures 1, 2 and 3 thereof, a fountain pen 10 is provided having for convenience in assembly a two piece barrel 11 including a rear portion 11a and a forward barrel portion 12 secured together in axial alignment by threaded plug 13. A point holder or gripping section 14 having a writing element 15 mounted therein is threadedly engaged with the forward end of barrel 11 for longitudinal reciprocation therewith. The two barrel portions and the point holder are shown as made of plastic material, although a metal or various other materials of a rigid nature could be used. The writing element 15 comprises a feed bar 16 which may be made from hard rubber or plastic and a nib 17 preferably of a non-corrosive metal having a capillary slit 18 therein communicating with a writing point 19. The capillary slit 18 terminates in a pierce 20, the pierce and slit being positioned adjacent a capillary aperture 21 in the feed bar 16. The feed bar 16 has a longitudinal bore 22 extending therethrough which slidably receives a filling member 23 containing an insert 24 having a capillary fluid feeding channel 25 which provides a fluid passageway from the forward end of the feed bar 16 to a reservoir 26 positioned in the barrel 11 and comprising a flexible sac. The filling member 23 has a fluid intake opening 27 at its forward end which is positioned rearwardly of the writing point 19 in the position illustrated in Fig. 1, and a fluid passageway 28 in communication with the fluid feeding channel 25. The exterior surface of the forward portion of the filling member 23 cooperates with the longitudinal bore 22 to provide a capillary fluid opening 29 in communication with the capillary aperture 21. The insert 24 has a cross section whereby a large air vent 30 is provided which will readily pass fluid upwardly during a filling operation and subsequently vent the reservoir 26 to the atmosphere to insure free flow of fluid therefrom during writing use of the pen.

During writing, fluid flows from the reservoir 26 along the fluid feeding channel 25 to a capillary slot 31 formed

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in the forward end of the insert 24. The capillary slot 31 is in communication with fluid passageway 28 in the filling member 23 which passes fluid to the fluid opening 29. The fluid then flows through capillary aperture 21 in the feed bar 16 to slit 18 in the nib 17. An expansion chamber comprising combs 32 and comb cuts 33 is formed in the feed bar 16 in communication with the capillary aperture 21. The annular comb cuts 33 formed around the feed bar 16 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 reservoir 26.

The writing element 15 is frictionally or otherwise secured in a longitudinal bore 34 formed in the point holder 14. The rearward end of the feed bar 16 abuts against a resilient gasket member 35 which is positioned in the point holder 14 against the shoulder 36. The gasket 35 has an aperture therein which forms a slidable fluid tight seal with the filling member 23 to prevent the rearward flow of fluid from the writing element. The rearward portion of the point holder 14 is provided with threads 37 and on its forward end a flared collar 38 which is adhesively or otherwise secured in a reduced forward portion of the point holder 14. The threads 37 of the point holder 14 are threadedly engaged with threads 39 formed in the interior bore of the forward barrel portion 12.

To condition the fountain pen 10 for the filling operation, the point holder or gripping section 14 is axially rotated with respect to the barrel 11. This rotational movement causes the point holder 14 to be drawn into the forward barrel portion 12 by means of the threads 37 and 39 until the rearward portion of the point holder 14 abuts the plug 13, thus positioning the writing point 19 of the writing element 15 rearwardly of the fluid intake opening 27 in the filling member 23, as shown in Fig. 2 in the drawings. The forward portion of the filling member 23 may then be dipped in a body of writing fluid to charge the reservoir 26.

The open forward end of the reservoir sac 26 which may be of a resilient rubber or plastic composition, is adhesively or otherwise secured to a rearwardly extending reduced portion of the plug 13 which includes a longitudinal bore 42 to frictionally receive the rearward end of the filling member 23 in a fluid tight relationship. Although the plug 13 is shown as made of a relatively hard rubber which will securely hold the filling member 23 in a fluid tight relationship, it may be formed of a number of substantially hard or rigid plastic or like materials. In the embodiment shown, the barrel 11 is provided with a lever type filling device comprising a lever 40 which acts in cooperation with a pressure bar 41 to deflate the reservoir sac 26 to expel air therefrom through the air vent 30 in the filling member 23. Upon return of the filling mechanism to the inoperative position, the reservoir 26 expands to its normal shape, thus being charged with fluid through the air vent 30 and fluid feeding channel 25 in the filling member 23, the air vent 30 and fluid feeding channel 25 being best illustrated in Fig. 3.

After the filling operation is completed, it is necessary to return the writing element 15 to the extended or writing position illustrated in Fig. 1. This is accomplished by axially rotating the point holder 14 with respect to the barrel 11 in a direction opposite to that employed in conditioning the pen for the filling operation. The threads 39 do not extend to the forward end of the bore of the barrel portion 12, thus, in combination with the abutment of the point holder 14 and plug 13, forming means of limiting both the forward and rearward longitudinal movement of the point holder 14.

With reference to Figures 4, 5 and 6, there is disclosed a modified form of the device previously described. In this modified form, the writing element is longitudinally reciprocal with respect to the point holder

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or gripping section which, in turn, is secured to the barrel in an axially rotatable relationship. This modification comprises a fountain pen 43 having for convenience in assembly a two piece barrel 44 including a rear portion 44a and a forward barrel portion 45 threadedly secured together in axial alignment. A point holder or gripping section 46 having a writing element 47 mounted therein is secured to and rotatable relative to the forward end of the barrel 44. The writing element 47 comprises a carrier member 48, a feed bar 49 and a nib 50. The nib 50 includes a capillary slit 51 which extends from a writing point 52 to a pierce 53. The pierce 53 and slit 51 are positioned adjacent a capillary aperture 54 in the feed bar 49. The feed bar 49 has a longitudinal bore 55 extending therethrough which slidably receives a filling member 56 having mounted longitudinally therein an insert 57. The insert 57, which may be composed of a hard rubber, plastic or non-corrosive metal, includes a capillary fluid feeding channel 58 which provides a fluid passageway from the forward end of the filling member 56 to a reservoir 59 positioned in the barrel 44. The filling member 56 has a fluid intake opening 60 at its forward end which is positioned rearwardly of the writing point 52 in the extended position shown in Fig. 4, and a fluid passageway 61 in communication with the fluid feeding channel 58. The exterior surface of the forward portion of the filling member 56 cooperates with the longitudinal bore 55 in the feed bar 49 to provide a capillary fluid opening 62 in communication with the capillary aperture 54. The insert 57 has a cross section whereby a large air vent 63 is provided which will readily pass fluid upwardly during a filling operation and subsequently vent the reservoir 59 to the atmosphere to insure a free fluid flow during writing use. The fluid passageway 61 is shown as disposed adjacent the forward end of the filling member 56. However, it is understood that the fluid passageway 61 may be positioned a greater distance from the forward end of the filling member 56 so that it remains at all times in communication with the fluid opening 62. It should also be manifest from the description of this embodiment that the fluid intake opening 60 in the forward end of the filling member 56 may be adapted to communication with the fluid opening 62 when the writing element 47 is in the extended position, thus making fluid passageway 61 unnecessary although it could be retained as a safety measure. These modifications have also been found to hold true in the corresponding parts in the embodiment shown in Fig. 1.

During writing, fluid flows from the reservoir 59 along the fluid feeding channel 58 to a capillary slot 64 formed in the forward end of the insert 57. The capillary slot 64 is in communication with fluid passageway 61 in the filling member 56 which passes fluid to the fluid opening 62. The fluid then flows through capillary aperture 54 in the feed bar 49 to slit 51 in the nib 50. An expansion chamber comprising combs 65 and comb cuts 66 is formed in the feed bar 49 in communication with the capillary aperture 54. The annular comb cuts 66 formed around the feed bar 49 are of such dimensions that they will not normally be filled with writing fluid but will retain fluid should atmospheric or temperature conditions cause a discharge from the reservoir 59.

The nib 50 and the feed bar 49 are frictionally or otherwise secured in a longitudinal bore 67 formed in the forward end of the carrier member 48. The rearward end of the feed bar 49 abuts against a resilient gasket member 68 which, in turn, abuts against the shoulder 69 formed in the carrier member 48 by the bore 70 of reduced diameter extending rearwardly thereof. The gasket member 68 which is preferably made from a relatively soft and resilient rubber, although it may be made of a non-rigid plastic material which is not effected by contact with writing fluid, has an aperture

therein which forms a slidable fluid tight seal with the filling member 56 to prevent the rearward flow of fluid from the writing element.

The carrier member 48 is provided with threads 71 which are engaged with threads 72 in the point holder or gripping section 46. The point holder or gripping section 46 has a rearwardly extending portion 73 on which the threaded collar 74 is rotatably held by annular ring 75 which is adhesively or otherwise secured adjacent the end of the rearwardly extending portion 73. The forward surface of the annular ring 75 slidably abuts the rearward end of threaded collar 74. Threaded collar 74 is threadedly engaged with the forward end of the barrel portion 45 which provides a relatively axially rotatable relationship between the point holder 46 and the barrel. The carrier member 48 has adjacent its rearward end a plurality of splines 76 which cooperate with a plurality of grooves 77 in the forward barrel portion 45 to restrain the writing element 47 against axial rotation when the point holder 46 is rotated with respect to the barrel.

To condition the fountain pen 43 for the filling operation, the point holder 46 is axially rotated with respect to the barrel 44 which causes the carrier member 48 and writing element 47 to move in a rearward direction, the splines 76 cooperating with the grooves 77 in the forward barrel portion 45 to prevent rotation of the carrier member and writing element 47 with the point holder 46. This action may be compared to the retraction of the writing lead in the usual mechanical pencil. The writing element 47 continues in a longitudinal rearward direction until the carrier member 48 abuts the forward end of the sac supporting member 78 which is formed on the rearward end of the forward barrel portion 45. This retracted position, in which the writing element 47 is positioned rearwardly of the fluid intake opening 60 in the filling member 56, is shown in Fig. 5 in the drawings. The forward portion of the filling member 56 may then be dipped in a body of writing fluid to charge the reservoir 59 without having to immerse the writing element 47.

The open forward end of the reservoir sac 59 is adhesively or otherwise secured to the sac supporting member 78 which includes a longitudinal bore 79 to frictionally receive the rearward end of the filling member 56 in a fluid tight relationship. In the embodiment shown, the barrel 44 is provided with a lever type filling device comprising a lever 80 which acts in cooperation with a pressure bar 81 to deflate the reservoir sac 59, thus expelling air therefrom through the air vent 63 in the filling member 56. Upon return of the filling mechanism to the inoperative position, the reservoir 59 expands to its normal shape, thus being charged with fluid through the air vent 63 and fluid feeding channel 58 in the filling member 56. Fig. 6 in the drawings best illustrates the relationship between the air vent 63 and the fluid feeding channel 58.

After the filling operation is completed, it is necessary to return the writing element 47 to the extended or writing position illustrated in Fig. 4. This is accomplished by axially rotating the point holder 46 with respect to the barrel 44 in a direction opposite to that employed in conditioning the pen for the filling operation. The threads 72 do not extend to the forward end of the point holder 46, thus forming a means of limiting the forward longitudinal movement of the writing element 47 when it is extended to the normal writing position.

As it will be apparent from the foregoing description, the writing element of this invention may be longitudinally reciprocated by any one of a number of means. For example, the reciprocation may be effected by a manual lever extending through the side of the implement. Also, any one of a number of means of filling the reservoir may be employed in place of the lever device shown in the two embodiments disclosed herein.

It will be understood, therefore, that the invention is not to be limited to the embodiments shown above, 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, a plug positioned in said barrel in spaced relation with the forward end thereof, a rearwardly extending fluid reservoir carried by said plug, a point holder threadedly engaged with the forward end of said barrel, a filling member mounted on said plug and having a fluid intake opening at its forward end, said filling member communicating with said reservoir and extending to a position forwardly of said point holder, and a writing element including a feed bar secured to and extending forwardly of said point holder, said point holder being rotatable with respect to said barrel to retract said writing element rearwardly of said fluid intake opening and extend the forward end of said writing element beyond said fluid intake opening, said filling member having therein a fluid feeding channel and disposed adjacent its forward end a capillary fluid passageway in communication with said channel and with said writing element when said writing element is in said extended position.

2. A fountain pen comprising a barrel having an internally threaded forward end, a reservoir within said barrel, a point holder threadedly engaged with said threaded forward end, a filling member secured in said barrel in communication with said reservoir and having a fluid intake opening at its forward end, said filling member extending to a position forwardly of said point holder, and a writing element including a feed bar secured to and extending forwardly of said point holder, said feed bar having a longitudinal bore therethrough adapted to receive said filling member, said point holder being rotatable with respect to said barrel to retract said writing element rearwardly of said fluid intake opening and to extend the forward end of said writing element beyond said fluid intake opening, said filling member having therein a fluid feeding channel and disposed adjacent its forward end a capillary fluid passageway in communication with said channel and with said writing element when said writing element is in said extended position.

3. A fountain pen comprising a barrel, a reservoir within said barrel, a point holder threadedly engaged with the forward end of said barrel, a filling member mounted on said reservoir in communication therewith and having a fluid intake opening at its forward end, said filling member extending to a position forwardly of said point holder, a writing element including a feed bar secured to and extending forwardly of said point holder, said point holder being rotatable with respect to said barrel to retract said writing element rearwardly of said fluid intake opening and extend the forward end of said writing element beyond said fluid intake opening, and means associated with said point holder to limit the longitudinal reciprocal movement of said writing element, said filling member having therein a fluid feeding channel and disposed adjacent its forward end a capillary fluid passageway in communication with said channel and with said writing element when said writing element is in said extended position.

4. A fountain pen comprising a barrel, a plug positioned in and spaced from the forward end of said barrel, a fluid reservoir secured to and extending rearwardly of said plug, a point holder threadedly engaged with the forward end of said barrel, a filling member mounted on said plug and having a fluid intake opening at its forward end, said filling member being stationary with respect to said barrel and opening into and projecting forwardly of said reservoir to a position beyond said point holder, an insert within said filling member and extending longitudinally thereof, said insert having a fluid

feeding channel and an air vent, a writing element including a nib and a feed bar secured to and extending forwardly said said point holder, said feed bar having a longitudinal bore therethrough, said bore being spaced from said nib and adapted to receive said filling member, said nib communicating with a capillary aperture extending into said bore, said point holder being retractable with respect to said barrel to position said writing element rearwardly of said fluid intake opening and extensible to position the forward end of said writing element beyond said fluid intake opening, and means associated with said point holder to limit the longitudinal reciprocal movement thereof, said filling member having disposed adjacent its forward end a capillary fluid passageway in communication with said fluid feeding channel and with said writing element when the forward end of said writing element is positioned beyond said fluid intake opening.

5. A fountain pen comprising a barrel, a reservoir secured against longitudinal movement within said barrel, a point holder threadedly engaged with the forward end of said barrel, a filling member mounted on and projecting forwardly of said reservoir and having a fluid intake opening at its forward end, said filling member communicating with said reservoir and extending to a position forwardly of said point holder, an insert within said filling member extending longitudinally thereof and providing a fluid feeding channel and an air vent, a writing element including a nib and a feed bar secured to and extending forwardly of said point holder, said feed bar having a longitudinal bore therethrough, said bore being spaced from said nib and adapted to slidably receive said filling member, said nib communicating with a capillary aperture extending into said bore, the forward portion of said filling member providing in cooperation with said bore a fluid opening of capillary dimensions, said point holder and said writing element being retractable as a unit with respect to said barrel to position said writing element rearwardly of said fluid intake opening and extensible to position the forward end of said writing element beyond said fluid intake opening, and means associated with said point holder to limit the longitudinal movement thereof, said filling member having disposed adjacent its forward end a capillary fluid passageway directing communication between said fluid feeding channel and said writing element through said fluid opening and said capillary aperture when said writing element is in said extended position.

6. A fountain pen comprising a barrel, a reservoir within said barrel, a filling member secured for communication with said reservoir and extending to a fluid intake opening positioned forwardly of said barrel, a point holder mounted for reciprocal movement within the forward end of said barrel, a writing element mounted for movement with said point holder and having an axial aperture slidably receiving said filling member, and means for permitting reciprocal movement of said point holder relative to said barrel to retract said writing element relative to said filling member to a position rearwardly of said fluid intake opening and extend said writing element to position its forward end beyond said fluid intake opening, said filling member defining a fluid passageway in communication with said reservoir and said writing element.

7. A fountain pen comprising a barrel, a fluid reservoir within said barrel, a substantially straight filling member mounted on said reservoir in communication therewith and having a fluid intake opening at its forward end, said filling member extending to a position forwardly of said barrel, a point holder mounted for reciprocal movement within the forward end of said barrel, a writing element supported by and movable with said point holder and having an axial aperture slidably receiving said filling member, and means for permitting movement of said point holder and said writing element

as a unit relative to said barrel to retract said writing element to a position rearwardly of said fluid intake opening and extend said writing element to position its forward end beyond said fluid intake opening, said filling member defining a fluid passageway in communication with said writing element when said writing element is in said extended position.

8. A fountain pen comprising a barrel, a fluid reservoir disposed within said barrel, a point holder mounted for reciprocal movement within the forward end of said barrel, a forwardly extending writing element mounted on said point holder for reciprocal movement therewith, a filling member mounted in said barrel and including a fluid intake opening at its forward end, said filling member communicating with said reservoir and extending through an axial aperture in said writing element to a position adjacent the forward end thereof, and means for permitting reciprocal movement of said point holder and said writing element as a unit with respect to said barrel to retract said writing element to a position rearwardly of said fluid intake opening and extend the forward end of said writing element beyond said fluid intake opening, said filling member defining a fluid passageway in communication with said reservoir and said writing element.

9. A fountain pen comprising a barrel having a grooved area disposed internally adjacent its forward end, a fluid reservoir mounted within said barrel rearwardly of said grooved area, a point holder secured on the forward end of said barrel for axial rotation relative thereto, a filling member secured in said barrel in communication with said reservoir and having a fluid intake opening at its forward end, said filling member being stationary with respect to said barrel and said reservoir and extending through an axial bore in said point holder to a position forwardly thereof, a writing element engaged for longitudinal movement within said bore and extending forwardly thereof and substantially surrounding said filling member, means on said writing element rearwardly of said point holder for slidable engagement with said grooved area for restraining said writing element against axial rotation with said point holder, and means for permitting said writing element to reciprocate within said bore relative to said barrel to a position rearwardly of said fluid intake opening and to position its forward end beyond said fluid intake opening upon axial rotation of said point holder with respect to said barrel, said filling member defining a capillary fluid passageway in communication with said reservoir and said writing element when said writing element is in said extended position.

10. A fountain pen comprising a barrel having a plurality of internally disposed longitudinally extending grooves adjacent its forward end, a resilient reservoir sac mounted within said barrel rearwardly of said grooves, a point holder secured for rotation relative to the forward end of said barrel, a substantially straight filling member secured in said barrel and having a fluid intake opening at its forward end, said filling member communicating with said reservoir and extending through an axial bore in said point holder to a position forwardly thereof, a writing element threadedly supported within said bore for longitudinal movement therein and substantially surrounding said filling tube, and a plurality of splines on said writing element rearwardly of said point holder and slidable in said grooves for restraining said writing element against axial rotation with respect to said barrel, said writing element reciprocating in said bore relative to said filling member to a position rearwardly of said fluid intake opening and to position its forward end beyond said fluid intake opening upon axial rotation of said point holder with respect to said barrel and said writing element, said filling member having therein a fluid feeding channel and disposed adjacent its forward end a capillary fluid passageway in communication with said

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channel and with said writing element when said writing element is in said extended position.

1,875,553
2,769,427

References Cited in the file of this patent

UNITED STATES PATENTS

Re. 23,683 Segre ----- July 7, 1953
1,856,655 Rese ----- May 3, 1932

5 21,631
345,039
65,429

10

Beardsley ----- Sept. 6, 1932
Martin ----- Nov. 6, 1956

FOREIGN PATENTS

Great Britain ----- 1908
Italy ----- Dec. 10, 1936
Denmark ----- Feb. 17, 1947