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FOUNTAIN PEN

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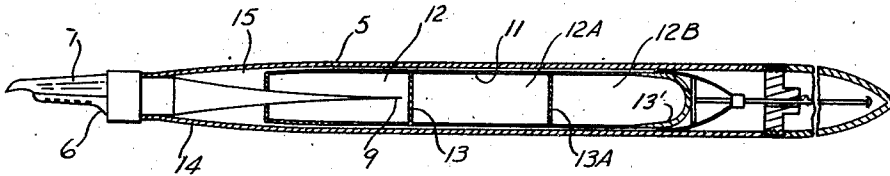


FIG. 1

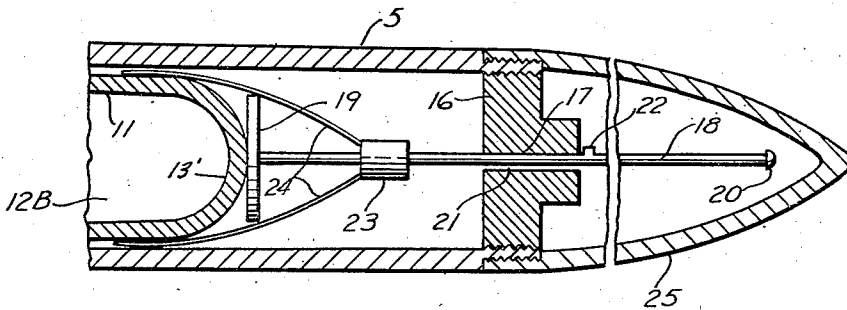


FIG. 2

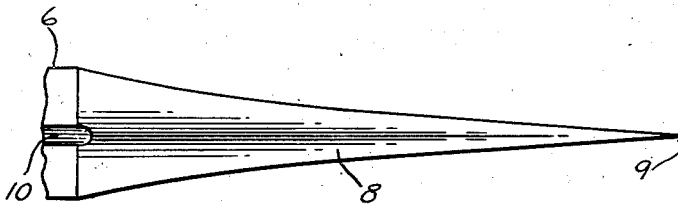


FIG. 3

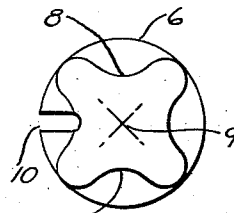


FIG. 4

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FOUNTAIN PEN

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6 Claims. (Cl. 120—42)

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This invention relates to improvements in fountain pens of that type in which the supply of ink to the point member of the pen is derived from a removable renewable cartridge inserted in the barrel of the fountain pen.

The primary object of the present invention is to provide a fountain pen of the above type in which the ink-containing cartridge is divided into a plurality of separate ink compartments by means of readily puncturable partitions, wherein a pointed puncturing member is mounted in the lower end of the fountain pen barrel for automatically puncturing the lower end of the cartridge to open the lowermost compartment of the latter when said cartridge is inserted in the fountain pen barrel, and wherein manually operable means is provided on the upper end of the fountain pen barrel and engageable with the upper end of the ink-containing cartridge for forcing the latter downwardly so as to successively puncture the partitions as additional supply of ink is found necessary from time to time.

In accordance with the present invention, the ink-containing cartridge has a longitudinal series of separate compartments that are successively opened as the supply of ink therein is needed. When the supply of ink is exhausted from one compartment, the additional supply is obtained from the next succeeding compartment, the lower empty portion of the cartridge collapsing as the latter is fed downwardly. This arrangement is particularly adapted for use by persons who do not write long or very often and for whom a limited supply of ink will last a comparatively long time. Under such circumstances, the ink in the unopened compartments of the cartridge will be maintained in a fresh condition with the air excluded therefrom until the additional supply of ink therein is required.

A further object of the present invention is to provide simple and efficient means for feeding the cartridge downwardly and preventing accidental downward forcing of the cartridge.

Still another object of the invention is to provide cartridge feeding means which will also facilitate introduction of the cartridge into the fountain pen barrel.

Other objects and features of the invention will become apparent from the following description when considered in connection with the accompanying drawing, and the invention consists in the novel form, combination and arrangement of parts hereinafter more fully described, shown in the drawing and claimed.

In the drawing, wherein like reference char-

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acters indicate corresponding parts throughout the several views:

Figure 1 is a view, partly broken away and mainly in central longitudinal section, of a fountain pen constructed in accordance with the present invention.

Figure 2 is an enlarged fragmentary view in central longitudinal section of the upper end portion of the pen shown in Figure 1, to more clearly reveal details of construction.

Figure 3 is a fragmentary elevational view of the pointed puncturing member of the pen, and

Figure 4 is an end view looking toward the left of Figure 3.

Referring in detail to the drawing, the present fountain pen includes an elongated hollow barrel 5 having a conventional fountain pen feeder plug 6 and point member 7 at the lower end thereof. Carried by the feeder plug 6 is an axial upward extension that is longitudinally fluted, as at 8, and pointed at its upper end, as at 9, to form a cartridge-puncturing element. The feeder plug 6 has the usual longitudinal groove 10 to facilitate flow of ink to the point of the pen point member 7.

The present invention contemplates the provision of a special ink-containing cartridge 11 adapted for insertion in the barrel 5. This cartridge is made of a suitable collapsible material, is closed at its ends and divided into a plurality of separate or non-communicating ink compartments 12, 12a and 12b by means of a plurality of transverse and equally spaced partitions 13 and 13a. At its upper end, the cartridge is preferably of reinforced or thickened as indicated at 13' so as to be of fairly rigid construction, but the lower end wall and the partitions 13 and 13a of the cartridge are preferably thin and adapted to be readily punctured by the pointed puncturing member. Also, the lower end portion of the barrel 5 is preferably tapered smaller, as at 14, to limit initial introduction of the cartridge within the barrel to a point wherein the lower end of the cartridge is spaced from the lower end of the puncturing member or the point where the latter joins with the feeder plug 6. The arrangement is such that when the cartridge is initially inserted in the barrel 5, the lower end of the cartridge only is punctured so that the initial supply of ink is obtained from the lowermost compartment 12.

It will be noted that by initially leaving the space 15 between the lower end of the cartridge 11 and the base of the puncturing member, sufficient room is provided for accumulation of the

lower end portion of the cartridge which is collapsed as the latter is fed downwardly to open the successive compartments of said cartridge. In addition, the puncturing member is abruptly tapered at its lower portion so that such portion is relatively large and will enlarge the puncture hole in the lower end of the cartridge as the partitions 13 and 13a are punctured, thereby insuring free flow of ink from the compartments 12a and 12b to the pen point member.

Means is provided to facilitate forcing the cartridge downwardly to successively puncture the partitions 13 and 13a as the supply of ink in the compartments 12a and 12b is needed. For this purpose, a plug 16 is removably threaded in the upper end of the barrel 5, and slidable through a central opening 17 of this plug is an elongated rod 18 having a plate 19 on its lower end arranged to bear against the upper end of cartridge 11. A knob 20 is provided on the upper end of rod 18 to facilitate pushing the same downwardly so as to thereby force the cartridge 11 downwardly when required. At one side of the opening 17, plug 16 is provided with a groove 21 adapted to slidably accommodate a lateral lug 22 on the rod 18 when said lug is registered with said groove. By positioning the lug out of registry with the groove 21 at the upper side of the plug 16, accidental inward movement of rod 18 is prevented and undesired downward forcing of the cartridge 11 is avoided. However, when it is desired to intentionally force the cartridge downwardly, the lug 22 can be registered with groove 21 by turning rod 18, whereupon the lug 22 can enter the groove 21 and allow the rod 18 to be forced inwardly or downwardly. By removing plug 16, the cartridge 11 may be introduced into the barrel 5 or an empty cartridge may be removed from the barrel to permit the insertion of a new cartridge. Slidable on the rod 18 is a sleeve 23 having a plurality of resilient depending jaws 24 that extend below the plate 19 and are normally tensioned to spring toward each other into gripping engagement with the upper end of the cartridge 11. By this arrangement, the cartridge may be initially held by the jaws 24 so that the cartridge-feeding means or device may be employed as a holder in inserting the cartridge in the barrel. By holding sleeve 23 and pulling outwardly on rod 18, the jaws 24 may be spread so that they can be engaged over the upper end of the cartridge 11. Downward movement of rod 18 will then allow the jaws 24 to contract into gripping engagement with the end of the cartridge. A predetermined downward movement of rod 18 may be indicated by graduations or additional lugs 22 on the latter to aid in properly feeding the cartridge downwardly to only puncture the partitions 13 and 13a one at a time.

A conventional form of cap 25 is detachably threaded on the upper end of barrel 5 so as to enclose the projecting upper end portion of rod 18 when manipulation of said rod 18 is not required. Access to the rod 18 for forcing the cartridge downwardly, however, may be readily had upon removal of the cap 25.

From the foregoing description, it is believed that the construction and operation, as well as the advantages, of the present invention will be readily understood and appreciated by those skilled in the art. The action of the present fountain pen may be likened to that of a conventional repeater-type lead pencil, in which leads are successively fed into position for use as they are needed. In the present case, ink compartments

of a cartridge or capsule are successively opened as their supply of ink is needed. It will be apparent that the construction is comparatively simple, inexpensive to manufacture and assemble, and easy to operate.

What I claim as new is:

1. A fountain pen comprising a barrel having a pen point member and a feeder plug at its lower end, a collapsible ink-containing cartridge movable longitudinally of and removably positioned in the barrel, said cartridge being divided into a longitudinal series of substantially similar non-communicating ink compartments by equally spaced readily puncturable transverse partitions, said cartridge being shorter than the barrel and having a readily puncturable lower end, an upwardly projecting pointed puncturing member of considerably greater length than each cartridge compartment carried by the feeder plug, and manually operable means carried by the upper end of the barrel and engageable with the upper end of the cartridge for forcing the latter downwardly to first puncture the lower end of the cartridge and then successively collapse the emptied portions of the cartridge and puncture the succeeding partitions as the supply of ink in the successive cartridge compartments is needed.

2. A fountain pen comprising a barrel having a pen point member and a feeder plug at its lower end, an ink-containing cartridge removably positioned in the barrel and divided into a longitudinal series of separate ink compartments by readily puncturable transverse partitions, said cartridge being collapsible and having a readily puncturable lower end, an upwardly projecting pointed puncturing member carried by the feeder plug, and manually operable means carried by the upper end of the barrel and engageable with the upper end of the cartridge for forcing the latter downwardly to puncture the lower end of the cartridge and successively puncture the partitions of the cartridge as the supply of ink in the cartridge compartments is needed, said manually operable means comprising a removable plug threaded in the upper end of the barrel, a rod slidable through the plug and having a plate upon its lower end arranged to bear against the upper end of the cartridge.

3. A fountain pen comprising a barrel having a pen point member and a feeder plug at its lower end, a collapsible ink-containing cartridge movable longitudinally of and removably positioned in the barrel, said cartridge being divided into a longitudinal series of substantially similar non-communicating ink compartments by equally-spaced readily puncturable transverse partitions, said cartridge being shorter than the barrel and having a readily puncturable lower end, an upwardly projecting pointed puncturing member of considerably greater length than each cartridge compartment carried by the feeder plug, and manually operable means carried by the upper end of the barrel and engageable with the upper end of the cartridge for forcing the latter downwardly to first puncture the lower end of the cartridge and then successively collapse the emptied portions of the cartridge and puncture the succeeding partitions as the supply of ink in the successive cartridge compartments is needed, said manually operable means comprising a removable plug threaded in the upper end of the barrel, a rod slidable through the plug and having a plate upon its lower end arranged to bear against the upper end of the cartridge, a sleeve slidable on the rod and provided with normally

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contracted jaws depending below the plates for gripping engagement with the upper end of the cartridge, said plate being movable upwardly to spread the jaws and release the cartridge.

4. A fountain pen comprising a barrel having a pen point member and a feeder plug at its lower end, an ink-containing cartridge removably positioned in the barrel and divided into a longitudinal series of separate ink compartments by readily puncturable transverse partitions, said cartridge being collapsible and having a readily puncturable lower end, an upwardly projecting pointed puncturing member carried by the feeder plug, and manually operable means carried by the upper end of the barrel and engageable with the upper end of the cartridge for forcing the latter downwardly to puncture the lower end of the cartridge and successively puncture the partitions of the cartridge as the supply of ink in the cartridge compartments is needed, said manually operable means comprising a removable plug threaded in the upper end of the barrel, a rod slidable through the plug and having a plate upon its lower end arranged to bear against the upper end of the cartridge, a sleeve slidable on the rod and provided with normally contracted jaws depending below the rod for gripping engagement with the upper end of the cartridge, said plate being engageable with the jaws to expand the latter and facilitate insertion of the upper end of the cartridge between the jaws upon upward movement of the rod relative to the sleeve.

5. A fountain pen comprising a barrel having a pen point member and a feeder plug at its lower end, an ink-containing cartridge removably positioned in the barrel and divided into a longitudinal

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series of separate ink compartments by readily puncturable transverse partitions, said cartridge being collapsible and having a readily puncturable lower end, an upwardly projecting pointed puncturing member carried by the feeder plug, and manually operable means carried by the upper end of the barrel and engageable with the upper end of the cartridge for forcing the latter downwardly to puncture the lower end of the cartridge and successively puncture the partitions of the cartridge as the supply of ink in the cartridge compartments is needed, said manually operable means comprising a removable plug threaded in the upper end of the barrel, a rod slidable through the plug and having a plate upon its lower end arranged to bear against the upper end of the cartridge, said plug having a groove at one side of the rod, and a lateral lug on the rod movable in the groove when registered with the latter to permit downward movement of the rod and downward forcing of the cartridge, said lug being adapted for arrangement above the plug and out of registry with the groove to prevent accidental inward movement of the rod and accidental downward movement of the cartridge thereby.

6. As a new article of manufacture, an ink-containing cartridge for fountain pens comprising a collapsible elongated container having a readily puncturable lower end and divided into a longitudinal series of substantially similar non-communicating ink compartments by means of equally spaced readily puncturable transverse partitions.

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