

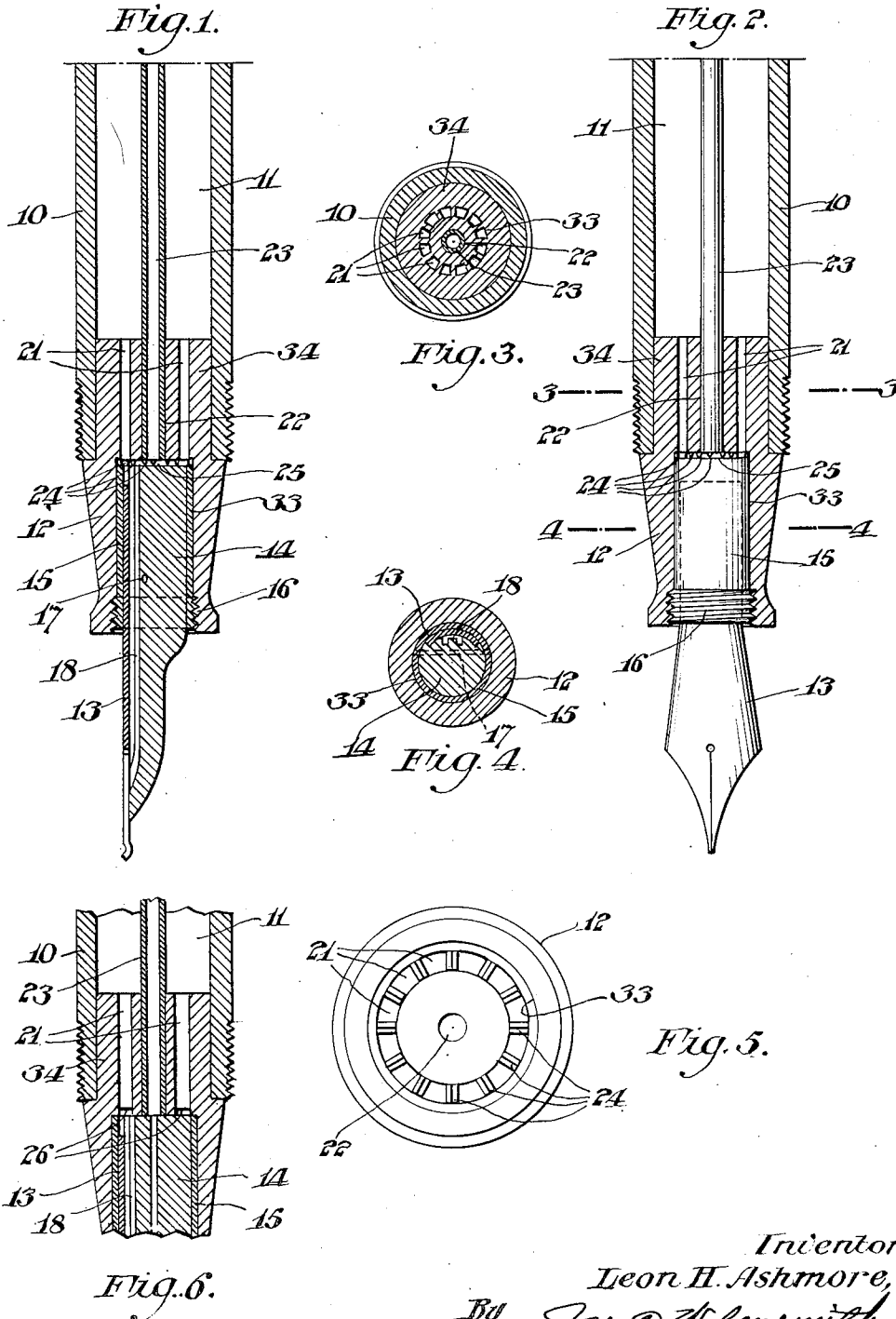
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FOUNTAIN PEN

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# UNITED STATES PATENT OFFICE

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## FOUNTAIN PEN

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7 Claims. (Cl. 120—52)

This invention relates to fountain pens and it relates more particularly to the provision in a fountain pen of improved means for insuring the proper flow of the ink to the pen point.

The invention is particularly adaptable to that type of fountain pen in which the pen point and feed member are secured to each other to provide a removable and replaceable pen point unit, although it should be understood that the invention is also applicable to various other types of fountain pens.

More specifically considered the invention contemplates certain improvements over the device described in Patent Number 2,152,436, R. H. Kocs, March 28, 1939.

It is, of course, well understood that, in order to insure the proper flow of ink to the pen point of a fountain pen, it is necessary not only to provide a proper conduit for the ink to flow from the barrel to the pen point, but also to so construct the feed device as to permit the air to be admitted to the interior of the barrel in a sufficient amount to prevent a vacuum being formed in the barrel as the ink is fed to the pen.

It has long been known that one of the most efficient devices for the foregoing purpose comprises the provision, in the feed member, of a longitudinally extending groove of peculiar conformation, the same usually being of an inverted U-shape to provide a central pathway for the passage of air and side channels for the passage of ink in the opposite direction.

However, it has been found that, in such structures, many times an air bubble will be formed at the inner end of the aforesaid channel which will interfere with the free flow of the ink, and that this occurs particularly in those pens in which the pen point and feed member are positioned in a central bore in the nipple, which bore is necessarily of smaller diameter than the barrel of the fountain pen. The same condition is also likely to occur in those fountain pens in which the ink is contained within a rubber sac positioned within the barrel of the fountain pen, for example, the self-filling type of pens in which the filling is accomplished by first squeezing and then releasing the sac.

The principal object of the present invention is to provide, in a fountain pen, a unitary nipple of integral construction whereby the retention of air bubbles, which tend to seal the inner end of the channel in the feed member and thereby prevent the free flow of ink to the pen point, will be effectively eliminated.

A further object of the invention is to pro-

vide a nipple for a fountain pen barrel which is particularly adaptable for use in connection with fountain pens of the type having a removable and replaceable pen point unit, which unit is threaded or otherwise held in the end of the nipple and which is likely to occupy varying relationships about the axis thereof with respect to the nipple.

A further object of the invention is to provide, in a fountain pen of the renew point type, means for increasing the effective length of the feed passages.

With the foregoing objects in view the present invention contemplates the provision of a nipple comprising a unitary and integral structure constructed and arranged to prevent the retention of air bubbles at the inner end of the channel in the feed member, so that a free and proper flow of the ink to the pen point will be assured at all times.

The nature and characteristic features of the invention will be more readily understood from the following description, taken in connection with the accompanying drawing forming part hereof in which:

Figure 1 is a vertical central section of the lower portion of a fountain pen embodying the main features of the present invention;

Fig. 2 is a similar view, the section being taken transverse to that of Fig. 1, and certain parts being shown in elevation;

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 2;

Fig. 4 is a horizontal section taken on the line 4—4 of Fig. 2;

Fig. 5 is an end elevation of the nipple member of the fountain pen, enlarged; and

Fig. 6 is a vertical central section similar to a portion of Fig. 1, but illustrating a modified form.

It should, of course, be understood that the description and drawing are illustrative merely, and that various modifications and changes may be made in the structure disclosed without departing from the spirit of the invention, and particularly that the invention is adaptable to the various types of self-filling pens, as well as to types which are filled by means of ink droppers or the like.

Referring to the drawing, the invention is shown as applied to a familiar type of fountain pen provided with a pen point unit which is easily and conveniently removable for the purpose of replacement by a similar unit when the pen point becomes worn or damaged.

In the structure there shown, 10 is the barrel providing an internal chamber 11 within which the ink is contained. At the lower end of the barrel is mounted a nipple 12, the peculiar structure of which comprises the principal novel feature of the present invention.

The nipple 12 is held in place by frictional engagement within the lower interior end of the barrel by tight fit, although if desired the nipple may be threaded in the lower end of the barrel, but this is not ordinarily done in fountain pens of the self-filling type. The lower end of the nipple 12 is provided with a central bore 33 extending longitudinally, but only part way, through the nipple member, for the reception of the pen point unit.

The removable pen point unit shown in the drawing comprises the pen point 13 which is mounted upon the feed member 14 and is held in place with respect thereto by means of a surrounding sleeve 15. The lower end of the sleeve is provided, as at 16, with threads which are complementary to threads provided interiorly at the lower end of the bore 33 of the nipple 12. The sleeve 15 is prevented from sliding longitudinally with respect to the feed member 14 by means of a transverse pin 17. The feed member 14 is provided with the usual channel 18 for the passage of ink and to vent the air. The channel 18 extends from the inner surface of the pen longitudinally under the pen to a point near the inner end of the bore 33 of the nipple.

The nipple 12 has a portion 34 extending from the inner terminal of the feed member and within the lower end of the barrel of the pen. This portion of the nipple may be provided with a central longitudinally extending opening 22 within which may be mounted a tube 23 serving as an air vent during the filling operation in certain types of self-filling fountain pens. However, said tube does not form an essential part of the present invention, and in some instances would be omitted entirely.

Surrounding the central opening is a series of longitudinally extending passageways 21 preferably disposed in a circle and close to each other. These passageways 21 may be of any preferred shape transversely and extend from close to the periphery of the bore 33, in which the pen point unit is mounted, to the interior of the barrel of the pen.

There is also provided means for preventing the inner end of the pen point unit from contacting with the inner end face of the bore 33 of the nipple in which the passageways 21 are disposed, which means may comprise a plurality of projections 24 extending from the walls between the passageways 21, each preferably of V-shaped conformation. In this manner, there is provided a space 25 between the upper end of the feed member and the inner end of the bore 33 in which said feed member is mounted. This space should not be too large and the extent thereof is definitely determined by the height of the projections 24 hereinbefore referred to.

By the arrangement above described, there is provided directly in the structure of the nipple 12, a series of spaced passageways 21 extending from the space 25 to the interior 11 of the barrel 10. It has been found that the passageways provided in the inner end portion 34 of the nipple 12 effectively prevent the formation of air bubbles in the inner end of the channel member 18 of the member 14 which, as hereinbefore pointed out,

often act as a seal to prevent the proper feed of the ink to the pen point.

It will be readily understood that when the removable pen point unit is threaded into position within the bore 33 of the nipple 12, there can be no assurance that the channel 18 of the feed member 14 will occupy any definite radial position within the nipple; but the provision of the plurality of passageways 21 in the inner end portion 34 of the nipple, as well as the space 25 between the inner end of the feed member and the inner end of the bore 33 of the nipple 12, will permit the venting air to pass to the interior of the pen barrel and will also permit the ink to be fed downwardly through the channel 18, as it will be quite apparent that the inner end of the channel 18 will always be adjacent one of the passageways 21 provided in the inner end portion 34 of the nipple 12.

In Fig. 6 of the drawing, there is illustrated a modified form of the invention in which the space 25, between the inner end of the feed member and the inner end of the bore 33 of the nipple 12, is omitted. In this form also, the passageways 21 are located somewhat nearer the central axis of the portion 34 of the nipple 12 so as to bring the same in alinement with the channel 18 of the feed member 14, and, in lieu of the projections 24, the partition walls between the passageways 21 are similarly shaped as at 26 at their lower ends so as to permit the venting air to pass to the interior 11 of the pen barrel 10, and the ink to be fed downwardly through the channel 18, no matter what radial position said channel may occupy when the pen point unit is mounted in position within the bore 33 of the nipple 12.

I claim:

1. In a fountain pen, a barrel portion adapted to serve as a reservoir to hold the ink, a nipple mounted in one end of said member, said nipple having a central bore, a removable pen point unit mounted in said bore, and the nipple having an integral portion extending into the barrel provided with a plurality of passageways extending therethrough from the inner end of the bore to the interior of the barrel, said passageway being disposed in spaced circular relationship.

2. In a fountain pen, a barrel portion adapted to serve as a reservoir to hold the ink, a nipple mounted in one end of said member, said nipple having a central bore, and a removable pen point unit mounted in said bore, said pen point unit having a feed member provided with a channel extending to the inner end of said feed member for the passage of the ink and venting air, and the nipple having an integral portion extending into the barrel provided with a plurality of passageways extending therethrough from the inner end of the bore to the interior of the barrel.

3. In a fountain pen, a barrel portion adapted to serve as a reservoir to hold the ink, a nipple mounted in one end of said member, said nipple having a central bore, a removable pen point unit mounted in said bore, said pen point unit having a feed member provided with a channel extending to the inner end of said feed member for the passage of the ink and venting air, the nipple having an integral portion extending into the barrel provided with a plurality of passageways extending therethrough from the inner end of the bore to the interior of the barrel, and means for spacing the inner end of the feed member of the pen point unit from the inner end of the bore.

4. In a fountain pen, a barrel portion adapted

to serve as a reservoir to hold the ink, a nipple mounted in one end of said member, said nipple having a central bore, a removable pen point unit mounted in said bore, said pen point unit having a feed member provided with a channel extending to the inner end of said feed member for the passage of the ink and venting air, the nipple having an integral portion extending into the barrel provided with a plurality of passageways extending therethrough from the inner end of the bore to the interior of the barrel, and the nipple having extensions at the inner end of the bore against which a portion of the pen point unit abuts to space the inner end of the feed member of the pen point unit from the inner end of the bore.

5. In a fountain pen, a barrel portion adapted to serve as a reservoir to hold the ink, a nipple mounted in one end of said member, said nipple having a central bore, a removable pen point unit mounted in said bore, said pen point unit having a feed member provided with a channel extending to the inner end of said feed member for the passage of the ink and venting air, the nipple having an integral portion extending into the barrel provided with a plurality of passageways extending therethrough from the inner end of the bore to the interior of the barrel, said passageways being disposed in spaced circular relationship, and means for spacing the inner end of the feed member of the pen point unit from the inner end of the bore.

6. In a fountain pen, a barrel portion adapted to serve as a reservoir to hold the ink, a nipple

mounted in one end of said member, said nipple having a central bore, a removable pen point unit mounted in said bore, said pen point unit having a feed member provided with a channel extending to the inner end of said feed member for the passage of the ink and venting air, the nipple having an integral portion extending into the barrel provided with a plurality of passageways extending therethrough from the inner end of the bore to the interior of the barrel, said passageways being disposed in spaced circular relationship, and the nipple having extensions at the inner end of the bore against which a portion of the pen point unit abuts to space the inner end of the feed member of the pen point unit from the inner end of the bore.

7. In a fountain pen, a barrel portion adapted to serve as a reservoir to hold the ink, a nipple mounted on one end of said member, said nipple having a central bore and a removable pen point unit mounted in said bore, said pen point unit having a feed member provided with a channel extending to the inner end of said feed member for the passage of the ink and venting air, and the nipple having an integral portion extending into the barrel provided with a plurality of passageways disposed in spaced circular relationship and extending therethrough from the inner end of the bore to the interior of the barrel, the channel of the feed member being in register with at least one of said passageways in any radial position of said channel.

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