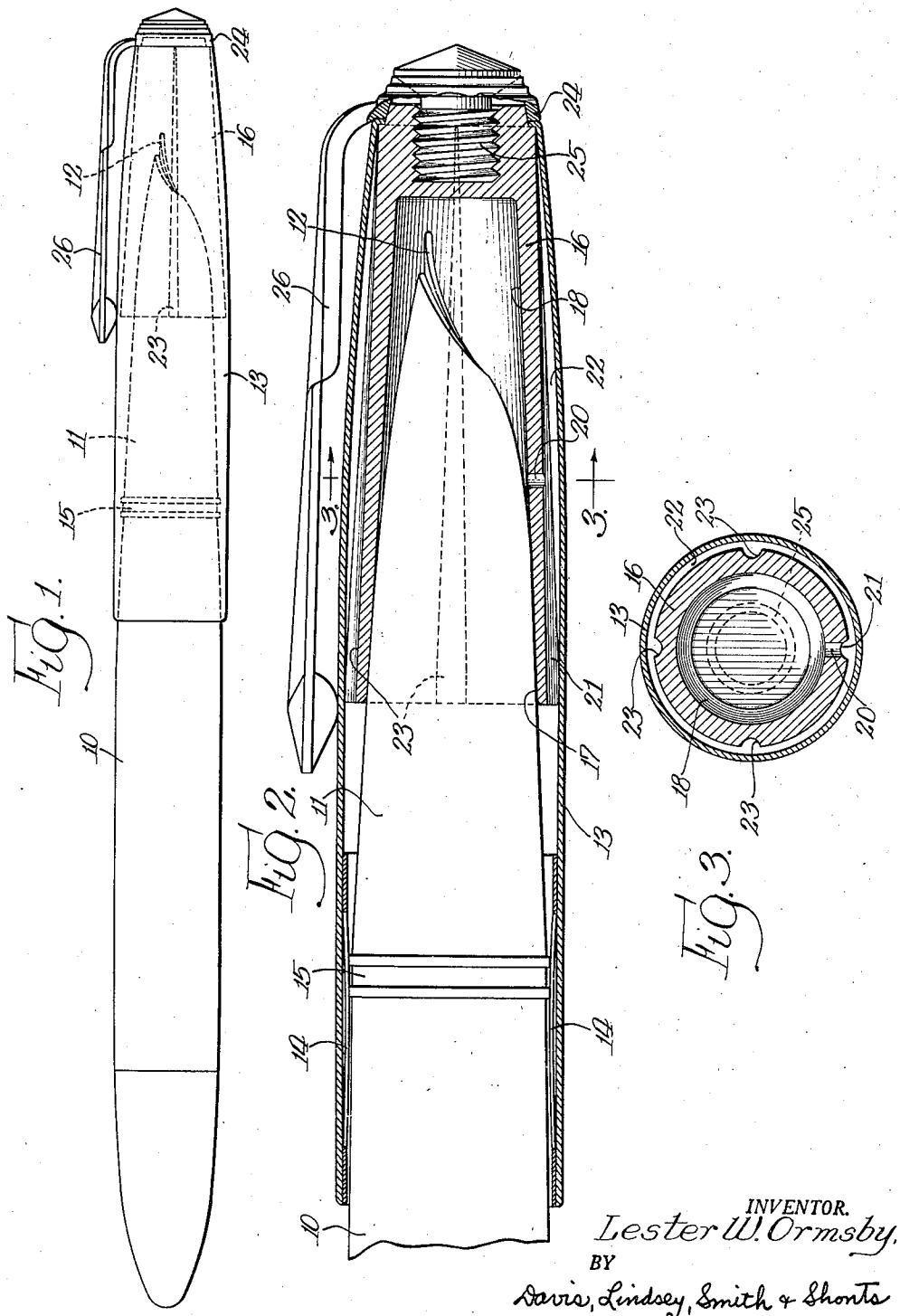
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FOUNTAIN PEN CAP CONSTRUCTION

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FOUNTAIN PEN CAP CONSTRUCTION

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The invention relates generally to fountain pens and more particularly to a fountain pen provided with a cap to enclose the writing end of the pen when not in use.

The general object of the invention is to provide a fountain pen having a novel cap construction which provides for venting of the interior of the cap to maintain the pressure therein at atmosphere and yet does not permit such free passage of air as to cause the ink on the nib to dry.

It is also an important object to provide a cap construction provided with a venting passage to equalize the pressure therein with the atmosphere when the cap is fixed on the pen, which comprises parts readily manufactured and which utilizes portions of the venting passage to facilitate the manufacture.

Another object is to provide a novel cap construction having a venting passage to equalize the pressure therein with the atmosphere when the cap is fixed on the pen, which passage is concealed so as not to detract from a smooth exterior appearance.

Other objects and advantages will become apparent from the following description taken in connection with the accompanying drawing, in which:

Figure 1 is a side elevational view of a fountain pen provided with a cap embodying the features of the invention.

Fig. 2 is a fragmentary view on an enlarged scale, similar to Fig. 1 but with the cap in section.

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

In a fountain pen of the type adapted to be carried by the user, a cap is provided to cover the writing end of the pen when not in use both to protect the clothing from being stained with ink and to prevent the ink from being drained from the point by contact with the clothing. The cap as a rule has a fairly tight fit on the body of the pen so that the space within the cap and around the point must be vented to allow for changes in the pressure within the pen and the outside atmosphere.

For example, if a pen is carried into high altitudes such as in airplane travel, the pressure within the barrel of the pen must be permitted to equalize with the lessened atmospheric pressure at such altitudes. The pen itself may be properly constructed to permit such equalization through the front end of the pen, but unless the cap is likewise vented, equalization will not occur. Increase in pressure within the pen may occur when a pen which has been lying in a relatively cool temperature is placed in a pocket where it is subjected to the warmth of the user's body. Changes in pressure within the cap relative to the pressure within the barrel of the pen may also occur as a result of the pumping action effected by placing the cap on the pen or withdrawing it therefrom by a sudden movement.

In venting a cap to provide for such pressure differences, a free and open vent passage could readily be provided but when the venting is so free as to cause a considerable flow of air around the point, the ink dries thereon, thus rendering the point unready for immediate use and tending to cause a clogging in the ink passages in the point. It is desirable therefore to restrict the venting as much as possible without causing any pressure differential, and to avoid a flow of air so far as possible in the immediate vicinity of the writing nib of the point. It is also desirable from the esthetic standpoint to conceal the vent so as not to detract from the exterior appearance of the cap.

The pen chosen to illustrate the invention comprises a main body or barrel 10. Attached to the body 10 is a shell 11 enclosing a feed mechanism including a nib 12 of which only the writing tip is exposed. The shell is provided with an opening in its forward end for admitting air to the reservoir or barrel 10. The feed may be of the form shown in the Baker Patent No. 2,223,541, issued December 3, 1940.

To enclose the point when not in use, a cap is provided which in the present instance comprises an outer shell 13 preferably made of metal and having a tubular form tapering somewhat at its front end. The outer shell 13 is adapted to telescope over the front end of the pen and a portion of the barrel 10 and to be secured thereto by a sliding movement, the cap being held on the pen by frictional means. In the present instance, such frictional means comprises a plurality of bowed spring fingers 14 adapted to engage a clutch ring 15 mounted on the barrel of the pen adjacent the shell 11.

The outer shell 13 is closed at its outer end by an inner shell 16 having a length substantially less than that of the outer shell 13. The inner shell at its open end is dimensioned to fit snugly on a tapering portion of the shell 11, as at 17, to limit the inward or telescoping movement of the cap on the pen. The snug fit 17 of the inner shell on the shell 11 thus closes off the interior space, indicated at 18, around the writing nib 12.

The pen itself is constructed to permit vent-

ing of the interior of the barrel through the point end of the pen. Thus it becomes necessary to vent the interior space 18 to the atmosphere in order that the pressure therein may be equalized with the atmosphere. Such venting of the interior space 18 is provided by a passage located at some distance from the writing nib 12 to avoid the production of air currents around the writing nib which would have a tendency to dry it and render the nib unfit for immediate use. To this end, the inner shell 16 is provided with a transverse passage 20 intermediate its ends and located rearwardly of the nib 12 but forwardly placed from the sealing engagement 17 between the inner shell and the front end structure 11.

From the transverse passage 20 a longitudinal passage is provided extending rearwardly to the rear end of the inner shell to open into the interior space within the outer shell 13. Such longitudinal passage is provided by and between the inner and outer shells and in the present instance is formed by a longitudinal groove 21 provided in the outer periphery of the inner shell 16 and extending at least from the transverse passage 20 to the rear end of the inner shell. Further venting from the transverse passage 20 in the present instance is provided by an annular space 22 between the inner and outer shells intermediate their ends, and additional longitudinal grooves 23 formed in the outer periphery of the inner shell.

Thus air may pass from the interior space 18 through the transverse passage 20 and then longitudinally through the groove 21 or any of the grooves 23, and into the interior of the outer shell 13 rearwardly of the inner shell. The outer shell provides for sufficient venting of its interior to the outside atmosphere by means of the spaces between the spring fingers 14 along the outer surface of the barrel 10. Thus the interior space 18 is provided with communication with the outside atmosphere so that changes in pressure within the barrel of the pen or in the space 18 may be equalized with the atmosphere.

In the manufacture of a cap of this construction it is desirable to produce the inner shell 16 by a molding process. Such inner shell is secured within the outer shell by means of a clamping ring 24 and a screw 25 threaded into a threaded bore formed in the end of the inner shell 16. The clamping ring 24 may, if desired, have a pocket clip 26 formed as an integral part thereof.

In molding the inner shell 16 the threads to receive the screw 25 are preferably formed in the molding process in a well known manner by a core extending into the molding die. When the piece has been molded, it is necessary to rotate the core to remove it from the piece without stripping the threads. The inner shell thus has to be held against rotation to permit such removal of the threaded core.

The present venting structure is such that it lends itself to such molding process by providing means by which the shell may be held against rotation during the removal of the threaded core. Thus the four longitudinal grooves 21 and 23 provide a ready means for engaging with corresponding ribs in the die to hold the shell against rotation in this operation. While the single groove 21 would probably be sufficient for venting purposes, the additional grooves 23 which, together with the groove 21, provide for non-rotative holding of the shell during molding, give the desired venting.

From the foregoing description it will be seen that I have provided a fountain pen having a novel cap construction which provides for venting of the interior of the cap so that the pressure therein may be readily equalized with the outside atmosphere and yet not cause such free passage of air as would dry the ink on the nib of the pen. The longitudinal grooves 21 and 23 constitute a simple form of passage for venting, which extend longitudinally of the cap and thus facilitate the manufacture of the cap since they provide a means for holding the latter against rotation during the molding process. The venting passage is completely concealed so that there is nothing to detract from the exterior appearance of the cap when mounted on the pen.

I claim:

1. In a fountain pen, a cap comprising an outer shell adapted to engage the pen to secure the cap thereto, and an inner shell fixed in said outer shell and providing an interior space around the point of the pen, said shells having a longitudinal passage therebetween, said inner shell having a transverse passage connecting said longitudinal passage with said space to permit equalization of the pressure in said space with the atmosphere.

2. In a fountain pen, a cap comprising an outer shell adapted to engage the pen to secure the cap thereto but permitting venting from the interior of the outer shell to the atmosphere, and an inner shell fixed in said outer shell and having its open end fitting snugly within the outer shell, said inner shell having a longitudinal groove in its periphery and a transverse passage connecting said groove with the interior of the inner shell to provide a passage from the interior of the inner shell to the vented space in the interior of the outer shell.

3. In a fountain pen, a cap comprising an outer shell having one end closed and the other end open and adapted to telescope over the front end of the pen, means adjacent the open end of the outer shell to secure it to the pen and having a vent to the atmosphere of the interior space adjacent said means, and an inner shell fixed in the closed end of said outer shell and providing an interior space around the point of the pen, said inner shell having a longitudinal groove in its periphery and a transverse aperture connecting said groove with the space within the inner shell to provide a passage from the space within the inner shell to the exterior of the cap.

4. In a fountain pen, a cap comprising an outer shell adapted to be telescoped over the front end of the pen and having a vent from the interior thereof to the atmosphere, an inner shell in the outer shell and adapted to fit over the front end of the pen and having a closed space around the point of the pen, and a screw securing said shells together and threaded into the end of the inner shell, said inner shell being molded and provided with a longitudinal peripheral groove to hold the shell against turning in molding the shell, said groove being connected to said closed space by a transverse passage to provide for venting said space to the atmosphere.

5. In a fountain pen, a cap comprising an outer shell and an inner shell secured together at one end by a screw axially extending and threaded into the inner shell, said inner shell being molded and provided with a longitudinal peripheral groove for holding the shell against turning in molding threads for said screw, the cap having a venting passage from the interior of the inner shell including said groove.

6. In a fountain pen, a cap comprising inner and outer shells closed at one end and open at the other and relatively having an annular space therebetween intermediate the ends of the inner shell, said inner shell having a transverse opening connecting its interior with said annular space and a plurality of longitudinal grooves in its periphery extending from said annular space to the open end of said inner shell to provide a venting passage from the interior of the inner shell.

7. In a fountain pen, a cap comprising an outer shell provided with means for securing the cap to the pen by longitudinal sliding movement, an inner shell fixed within the outer shell and adapted to snugly engage a portion of the pen to limit inward sliding movement of the cap, said inner shell providing a space around the point of the pen which is closed by such snug engagement with the pen, and means to vent said space comprising a longitudinal passage formed by and between the outer and inner shells and a transverse passage through said inner shell connecting said space with said longitudinal passage.

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