

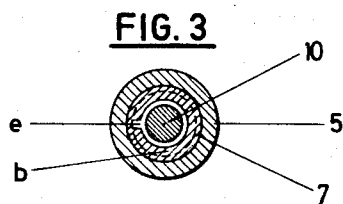
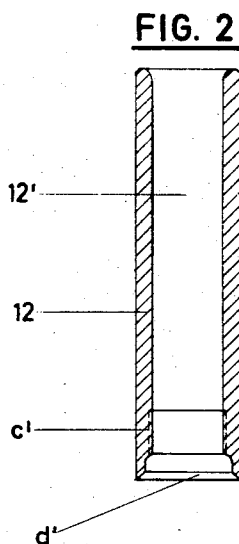
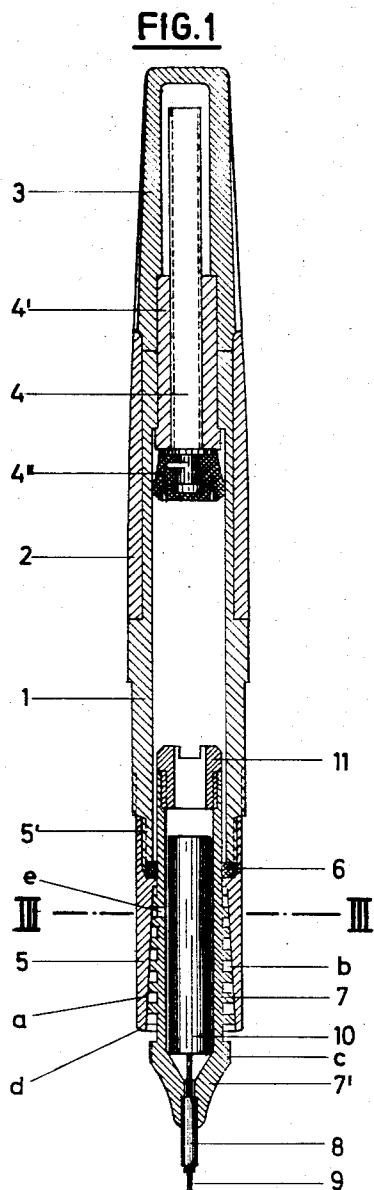
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FOUNTAIN PEN WITH SIPHON-PEN INSERT

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1

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FOUNTAIN PEN WITH SIPHON-PEN INSERT
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ABSTRACT OF THE DISCLOSURE

A fountain pen is provided with a siphon-pen insert in one end with a detaching tool for removing the insert from the tubular body of the pen. The insert has a frusto-conically shaped surface which fits in frictional engagement into a similarly shaped surface on the body of the pen. The insert has helical grooves in its frusto-conically shaped surfaces for providing compensating channels communicating with the ink chamber within the pen. A gasket is positioned within the pen to provide a seal between different parts of the tubular body of the pen and between the body of the pen and the insert.

The present invention relates to a fountain pen which is provided with a siphon-pen or writing-tube insert and is especially adapted for writing or drawing with india ink.

It is a well-known fact that such fountain pens, especially when used for india ink, have to be cleaned occasionally and that especially the ink channel as well as the air and pressure-compensating channel of such a pen have to be cleaned at regular intervals since these parts become easily clogged with dried ink. Some of the known fountain pens of this type have therefore been provided with an insert which carries the siphon pen or writing tube and is removable from the pen holder so as to permit the mentioned channels to be easily cleaned. The siphon-pen insert of these fountain pens was for this purpose provided with a screw thread and screwed into the front end of the pen holder. It has, however, been found that this screw thread becomes easily clogged by dried ink so that the entire siphon-pen insert can be removed from the pen holder only with considerable difficulty, for example, only by means of a pair of pliers, especially since the outwardly projecting part of the insert is too small to be tightly gripped by hand. The use of pliers for unscrewing the siphon-pen insert may, however, easily result in damage or destruction of the insert or the entire fountain pen.

It is an object of the present invention to provide a fountain pen of the above-mentioned type which is designed so as to permit the siphon-pen insert to be secured to the pen holder in a manner so as to be easily removed therefrom even if the ink has penetrated into the joint between the insert and the front end of the holder and has dried therein.

Another object of the invention is to provide a siphon-pen insert which may be easily removed from the pen holder by means of a special detaching tool without any possibility of damage to the insert or the pen holder.

A further object of the invention is to provide this detaching tool as a part of the fountain pen which may be fitted like a cap upon the front end of the pen holder so as to protect the siphon pen when the fountain pen is not being used and may be fitted upon the rear end of the pen holder so as to extend its length when the fountain pen is being used for writing or drawing.

The features and advantages of the present invention will become more clearly apparent from the following

2

detailed description thereof which is to be read with reference to the accompanying drawings, in which:

FIGURE 1 shows a longitudinal section of a fountain pen according to the invention from which the protective cap is removed;

FIGURE 2 shows a longitudinal section of the detaching tool; while

FIGURE 3 shows a cross section which is taken along the line III—III of FIGURE 1.

As illustrated in FIGURE 1 of the drawings, the fountain pen according to the invention essentially consists of the central parts 1 and 2 of the tubular shank or pen holder, of a plunger mechanism 3 and 4 within this holder, of a front part 5 of the holder, and a tubular insert 7 which carries the siphon pen 8 and the parts associated therewith. The plunger mechanism 3 and 4 may be of a conventional type as employed in fountain pens and comprises a rotary knob 3 which may be provided with longitudinal ribs or knurling, a tubular nut member 4' which is rigidly secured to the knob 3 but rotatable within the holder 1, 2, and a spindle 4 which is screwed into the nut member 4' and carries a plunger 4'' which is in sealing engagement with the inner surface of the holder part 1. When the knob 3 is turned about its axis, spindle 4 with plunger 4'' thereon will be moved in the axial direction.

The front part 5 of the holder is screwed by means of a thread 5' upon the front end of its central part 1 and tightly sealed relative thereto by a gasket ring 6 which also seals the tubular insert 7 relative to the holder 1, 2.

This insert 7 consists of a tubular shank which has a conical outer surface *a* which tapers toward the rear and is provided with a helical air-inlet and compensating groove *b*. At its front end, this shank part of the insert 7 terminates into a writing tip 7' which carries the siphon pen or writing tube 8. By means of its rearwardly tapering cone *a*, the siphon-pen insert 7 is tightly fitted into a corresponding conical bore in the front part 5 of the holder and is thus firmly held therein by the frictional connection between the insert 7 and the front part 5 of the holder. By providing the air and compensating channel *b* in the conical outer surface of the insert 7 the advantage is attained that this channel may be easily cleaned from the outside. The helical shape of this channel *b* has the advantage that it facilitates and improves the frictional connection between the insert 7 and the holder part 5 and that the web between the helical groove is thereby given the highest possible stability of shape in the direction in which the insert 7 is screwed into the holder part 5. The helical channel *b* is preferably designed so that its cross-sectional area of flow gradually increases from its rear end toward its front end. The central bore of the insert 7 contains a weight member 10 which is freely slidable therein and carries on its front end a cleaning wire 9 which projects through the siphon pen 8.

In order to prevent the weight member 10 together with the cleaning wire 9 from falling out of the writing insert 7, 7' when the latter is pulled out of the front part 5 of the holder, the rear end of the insert 7 is provided with a removable stop member in the form of a tubular screw 11 which is provided with a wire screw slot to permit it to be screwed into and out of the insert 7 by means of a coin.

The filling operation of the fountain pen according to the invention may be carried out in the usual manner by retracting the plunger 4'' and thereby sucking the ink into the holder. For writing with this fountain pen, the end of the siphon pen 8 is applied upon the writing surface whereby the cleaning wire 9 together with the weight member 10 will be pushed upwardly so that the ink can flow from the end of the siphon pen as required.

3

When the air above the level of the ink in the ink chamber of the pen increases in temperature and thereby expands, it will press the excessive ink through the radial bore *e* into the helical compensating channel *b*. When the ink level drops, air will pass in the opposite direction through the compensating channel *b* and the radial bore *e* into the ink chamber. The front end 7' of the insert 7 which projects from the holder 1, 2, 5 is provided with a screw thread *c* which corresponds to the interior thread *c'* near one end of a tubular detaching tool 12. This detaching tool 12 may be used like the cap of a conventional fountain pen either for being fitted over the rear end of the holder so as to extend its length for writing or for being fitted over the front part 5 of the holder so as to cover and protect the siphon pen 8 when the fountain pen is not being used. The associated contact surfaces *d* and *d'* on the front end of the holder 1, 2, 5 and in the end of the detaching tool 12 have a corresponding spherical cross section and are convex and concave, respectively, so that, when this end of the detaching tool 12 is screwed upon the thread *c* on the insert and 7', the two contact surfaces *d* and *d'* will uniformly engage with each other like the surfaces of a ball-and-socket joint even though because of inaccuracies of manufacture the axis of the thread *c* does not coincide with the main axis of the holder. If the insert 7 is to be cleaned, the fountain pen is held vertically with its tip pointing in the upward direction, the detaching tool 12 is then screwed with its thread *c'* upon the thread *c* on the projecting part 7' of the insert 7 and, after the edge *d'* on tube 12 abuts against the edge *d* on the front end of the holder part 5, tube 12 is further turned so that the insert 7 will press against the end of the holder part 5 and thereby loosen the conical surface *a* of the insert from the conical bore in the holder part 5 so that the entire siphon-pen insert 7 to 10 may then be easily withdrawn from the holder.

The tubular detaching tool 12 is then held with its free end upwardly under a stream of water coming from a faucet so that the water will flush through the tube 12 and the insert 7 thereon.

After the cleaning operation, the detaching tool 12 is unscrewed from the insert 7 and the latter is again fitted into the inner cone *a* of the holder part 5 so that the fountain pen is again ready for writing.

As clearly apparent from FIGURE 1, the holder is composed of several parts and the joint between the central part 1 and the front part 5 of the holder is located within a plane which intersects the rear part of the insert 7. The gasket ring 6 between the central part 1 and the front part 5 of the holder engages tightly upon the outer peripheral surface of the rear part of the insert 7 and thus also serves for sealing the tubular insert relative to the ink chamber and the holder.

The tubular insert 7 as well as the front part 5 of the holder and the detaching tube 12 are preferably made of a transparent plastic so as to permit the air or compensating channel *b* to be inspected from the outside to determine whether it requires cleaning and after the cleaning operation, whether it has been properly cleaned.

Although my invention has been illustrated and described with reference to the preferred embodiment thereof, I wish to have it understood that it is in no way limited to the details of such embodiment but is capable of numerous modifications within the scope of the appended claims.

Having thus fully disclosed my invention, what I claim is:

1. A fountain pen comprising a tubular holder with an ink chamber therein and having a conical bore in its front end, a siphon-pen insert having a front part adapted to project from said holder and having a rear part with a conical outer surface adapted to be tightly fitted into said conical bore and to be removable therefrom, said

4

insert having an outwardly facing screw thread on its projecting part, and a tubular detaching tool having a corresponding inner screw thread in one end thereof adapted to be screwed on said outer thread until said tool presses against the front end of said holder and thereby loosens said insert from said conical bore so as to permit said insert to be withdrawn from said holder.

2. A fountain pen as defined in claim 1, in which said detaching tool is adapted to be used as a cap to be fitted over the front end of said holder so as to cover the projecting part of said siphon-pen insert when the fountain pen is not in use and over the rear end of said holder so as to extend its length when the fountain pen is to be used for writing.

3. A fountain pen comprising a tubular holder, said holder comprising a tubular central part forming an ink chamber, a plunger mechanism disposed within one end of said central part, and a tubular front part disposed on the other end of said central part, said front part disposed in threaded engagement with said central part, said front part having a shoulder formed in its surface facing said central part, said central part having a shoulder disposed in opposed spaced relationship with the shoulder on said front part, a gasket disposed between the shoulders on said front part and central part to form a seal therebetween and extending inwardly into the ink chamber in said central part, said front part having a bore therethrough with the surface thereof in diverging relationship in the direction of its end remote from said central part, and a siphon-pen insert having the first part thereof disposed within the bore in said front part and a second part extending outwardly from said front part, a portion of the first part of said siphon-pen insert having a tapering surface arranged to conform to and to fit within and in frictional engagement with the bore in said front part, the tapering surface of said first part having a helical groove formed therein extending from the outer end of the bore in said front part toward and short of the shoulder in said front part, said first part of said siphon-pen insert having a cylindrical surface extending from said tapered surface into said central part and disposed in spaced relationship to the interior surface thereof, and said gasket disposed in sealing engagement with the cylindrical surface of said first part.

4. A fountain pen as defined in claim 3, wherein said helical groove in the first part of said siphon-pen insert is adapted to serve as an air and compensating channel and the cross sectional area of flow of said channel gradually increases toward the front end of said siphon-pen insert.

5. A fountain pen as defined in claim 4, in which said helical groove has a uniform width and its bottom is uniformly spaced throughout its length from the axis of said holder.

6. A fountain pen as defined in claim 5, in which the contact surfaces on the front end of said holder and on the end of said detaching tool containing said inner screw thread have a convex and concave shape, respectively.

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