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3,038,506

FILLER DEVICE FOR FOUNTAIN PENS

Filed Feb. 6, 1961

2 Sheets-Sheet 1

FIG. 1

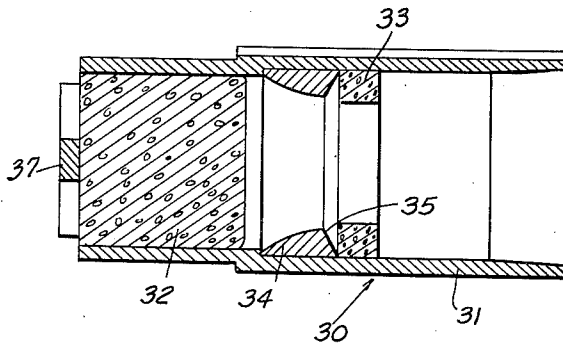


FIG. 2

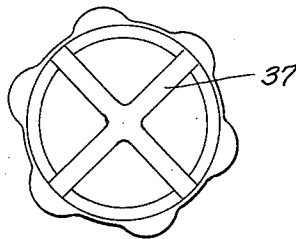
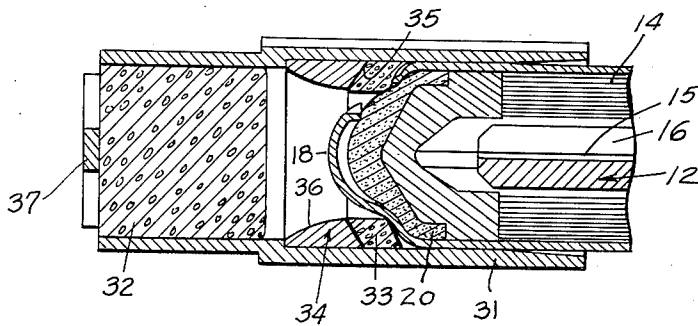


FIG. 3



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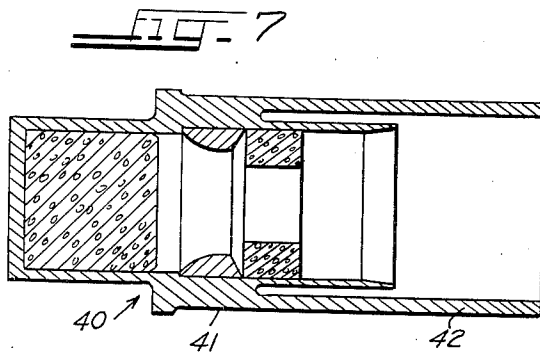
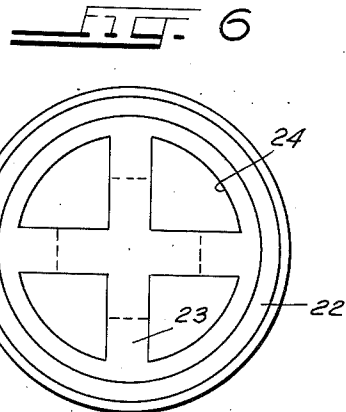
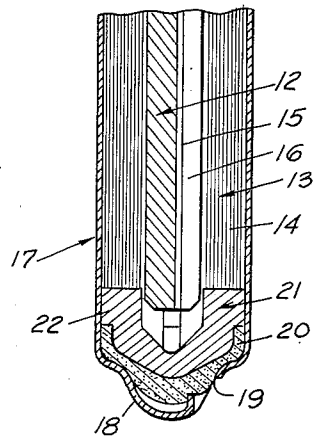
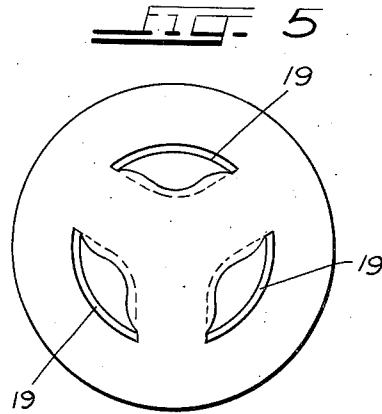
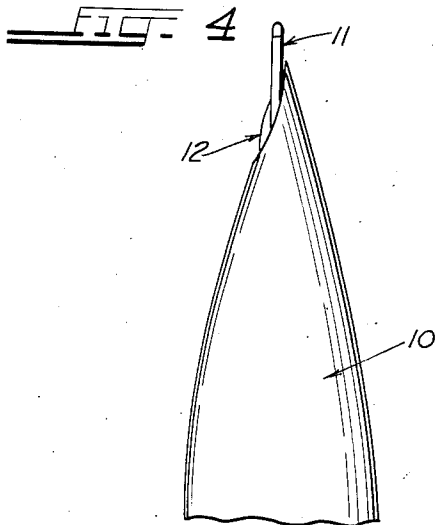
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FILLER DEVICE FOR FOUNTAIN PENS

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2 Sheets-Sheet 2



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FILLER DEVICE FOR FOUNTAIN PENS

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8 Claims. (Cl. 141-30)

This invention relates to filler devices for fountain pens and more particularly to a filler device for a fountain pen of the type having a reservoir provided with a filling valve through which ink is drawn into the reservoir of the pen in the filling operation. The filler device is so formed that upon application of the filler device to the reservoir, it opens the valve so that upon immersion of the filler device in a supply of water, water can pass through the filler device wherein it picks up ink concentrate and forms ink which is drawn into the reservoir.

The present invention is especially adapted for use with a fountain pen of the type having a reservoir element or unit including a reservoir which is so formed that upon removal of at least a portion of the pen casing, ink can be drawn into the reservoir for filling the reservoir and having a filler valve for retaining the ink in the reservoir after the filling operation and before the reservoir element or unit is returned to its normal position in the pen casing. One example of such a pen is disclosed in United States Patent No. 2,935,044 to Frederick R. Wittnebert, Raymond L. Spaulding, and Ray A. Lawton.

It has been found desirable to provide a pen which can be filled without requiring that a bottle of liquid ink be provided. For example, it is often desirable that the ink be in such form that it can be carried in the pocket or purse of the user without spilling or leaking. The present invention provides a device which is adapted to be attached to the end of the unit of a pen such as disclosed in said patent whereby upon immersion of the device thus attached in a body of water, the water is drawn through the device and dissolves an ink concentrate contained in the device whereby ink is drawn into the reservoir.

An object is to provide a novel filler device for a fountain pen whereby, upon application of the device to the reservoir unit of the pen and the immersion of the device in a supply of water, ink is formed by the passage of water through the device and drawn into the reservoir of the pen.

Another object of the present invention is to provide a novel filler device for a capillary fountain pen whereby the pen can be filled by merely applying the device to the capillary reservoir unit of the pen and immersing the device in a supply of water.

A further object is to provide a filler device for a fountain pen of the type having a capillary filler valve wherein is provided means for removing ink from the filler valve to permit a liquid, such as water, to be drawn through the device to pick up ink concentrate from the device and fill the reservoir with ink.

A further object is to provide a filler device for a fountain pen of the type having a filler valve which is adapted to hold ink in the pen after filling, which device has means for opening the filler valve upon application of the device to the pen to permit ink to be drawn into the reservoir of the pen.

Still another object is to provide a filler device for a fountain pen of the type having a filler valve formed of absorbent material and adapted to hold ink in the reservoir by capillary action, which device has means for drawing ink out of the filler valve to open the passages through the absorbent material and allow ink to pass through the filler valve and into the pen reservoir.

Still another object is to provide a filler device for a capillary pen which device is so formed that, upon the

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application of such device to the capillary reservoir unit of the capillary pen and the immersion of such device in water, ink is drawn into the reservoir of the pen.

Other objects and advantages of the invention will appear from the following description taken in connection with the appended drawings wherein:

FIGURE 1 is an elevational view partially in section of a filling device constructed in accordance with the present invention;

FIG. 2 is an end view of the device of FIGURE 1;

FIG. 3 is a longitudinal sectional view of the device of the present invention in association with a capillary reservoir unit of the type with which the device is adapted to be used;

FIG. 4 is a fragmentary side elevational view, partially in cross-section of a fountain pen and including a capillary filler unit with which the device of the present invention is adapted to be used;

FIG. 5 is an end elevational view of the unit of FIG. 4;

FIG. 6 is an end elevational view of the plug forming a portion of the filler unit of FIG. 4; and

FIG. 7 is a view similar to FIGURE 1 only showing another embodiment.

The device of the present invention is particularly adapted for use with a fountain pen of the type disclosed in U.S. Patent No. 2,935,044 to Frederick R. Wittnebert, Raymond L. Spaulding, and Ray A. Lawton. This pen, a portion of which is shown fragmentarily in FIG. 4 of the drawings, includes a front section 10 commonly referred to as a shell, and a rear section or barrel (not shown) adapted to be assembled and attached to the front section by a sleeve (not shown) for forming the casing or housing of the pen. The front section carries a nib 11, a feed bar 12, and a capillary filler element 13, or reservoir element, formed of one or more sheets of thin material rolled in spiral fashion to form a plurality of radially spaced wall portions, all as described in the aforesaid patent. The wall elements form between adjacent ones thereof, ink storage spaces 14, of such dimensions as to hold ink therein by capillary action. The capillarity of the spaces is such that, when the filler element is immersed in a body of ink with the rearward ends of the capillary spaces in communication with such ink, the ink is drawn into such spaces by capillary action and is retained therein by capillary action.

The feed bar 12 is provided with a plurality of feed grooves or passages 15, one of which is shown, and a control passage 16, adapted to feed ink from the capillary reservoir element to the nib as ink is withdrawn from the nib in writing and to permit air to pass into the reservoir to replace ink withdrawn therefrom in writing.

The reservoir element 13 is encased in a housing 17 which is generally cylindrical in shape and is secured at its front end in fixed relation within the front section 10. At its rear end, the housing 17 is formed with a dome-like portion 18 around the periphery of which are a plurality of filling apertures 19 of generally segmental shape, as seen particularly in FIGS. 4 and 5. A filler valve is provided at the rear of the housing which serves to at least aid in holding the ink in the reservoir when the rear section is removed from the front section (as explained in said Wittnebert, Spaulding and Lawton patent).

The filler valve 20 is positioned in the rear end of the housing and preferably takes the form of a slug of generally cup-shaped form. It is formed preferably of high-capillarity material, that is, of substantially greater capillarity than the spaces in the filler element. The material preferably is felt, but other material having the desired characteristics may be used as, for example, sponge, mesh, etc.

The valve 20 may be spaced from or engage the reservoir element 13 and in the illustrative embodiment is

spaced from the rear end of the filler element by a filler plug 21 having a forward annular portion 22 engaging the rearward end of the reservoir element and a plurality of radially extending ribs 23 with openings 24 therebetween. The valve element 20 is retained between the rearward portion of the plug and the end of the housing, as seen particularly in FIG. 4 of the drawings. As will be seen, the valve 20 is exposed through the filling apertures 19 in the housing 17.

In filling this pen in the usual manner, the rear section (not shown) of the casing is removed and the rear end of the housing 17 is inserted in the ink to a level whereby the rear ends of the capillary spaces are in communication with the ink. The ink thus flows through the valve 20, the spaces 24, and into the capillary spaces 14, whereupon it is drawn upwardly to fill the capillary spaces, the air which was in the spaces being displaced from the pen through the control passage 16, the feed slots 15, and the front end of the front section 10. When the pen is removed from the ink and placed in point-down position, the valve 20 aids in retaining the ink in the pen by capillary action.

The filler valve, being of greater capillarity than the capillary spaces in the filler reservoir unit retains ink therein after the pen has been filled and thus prevents the entry of air into the rear end of the housing 17 and into the rear ends of the capillary spaces. This action thus provides an air lock which aids in maintaining the ink in the capillary filler element when the pen is placed in point-down position. When the pen is removed from the supply of ink and rear section (not shown) is assembled therewith, a sealing valve assembly (not shown) in the rear section closes the rear end of the housing and provides an air lock which aids in maintaining the ink in the capillary filler element, all as shown and described in the aforementioned patent.

In accordance with the present invention, a filling device is provided which contains therein an ink concentrate whereby the filling device may be assembled on the rear end of the housing 17 and the assembly of pen and filling device inserted in a quantity of water. The water passes through the filling device and, in so doing, picks up the ink concentrate and forms ink of a suitable concentration which is drawn into the capillary filler element, whereby the pen is in condition for writing as thought it had been filled with conventional ink in the manner previously described herein.

The filling device 30 includes a generally cylindrical, tubular casing or outer shell 31 having its forward end dimensioned to fit over the rear end of the housing 17, as shown particularly in FIG. 3 of the drawings. The bore of the casing 31 preferably is flared to permit ready insertion of the end of the housing 17 therein. At its rearward end, the outer shell 31 carries a rear or bottom sponge 32 containing an ink concentrate of such composition that, when water is drawn through the sponge, the ink concentrate is dissolved therein or diluted thereby and forms with the water, ink of the proper concentration for writing. It is to be understood that, while the member 32 is referred to as a sponge, and preferably is formed as a cellulose sponge, it may be formed of any suitable sponge-like material having spaces therein of suitable dimension for receiving and retaining a quantity of liquid ink concentrate. The rear sponge 32 is retained in position by a plurality of rear end ribs 37 forming a part of the outer shell and having spaces therebetween to admit the passage of water into the filler device as will be understood from the following description.

Forwardly of the rear or bottom sponge is a forward or top sponge preferably of annular form which may be formed of any suitable absorbent material having a slightly greater capillarity than the filling valve 20. It will be understood that the forward sponge does not necessarily have to be annular in form but can take any suitable form which will permit it to contact the exposed portions of

the filling valve 20 when the filler device is applied to the end of the pen as shown per example in FIG. 3. The forward sponge 33 is so shaped and dimensioned that it receives the reduced end of the housing 17 when the housing is inserted in the outer shell and is in position to be abutted by the shoulder-like formation on the rear end of the housing and by the portions of the filler valve 20 which are exposed through the filling openings 19.

A rigid spacer or abutment member 34 is fixed in the outer shell 31 between the forward sponge 33 and the rearward sponge 32 and has an inclined forward surface 35 of generally conical shape for a purpose hereinafter described. Rearwardly of the surface 35 is a generally conical but curved, rearwardly divergent surface 36, the purpose of which will be explained hereinafter. In this connection, it will be noted that there are no sharp edges in the interior of the filler device between the rear end of the outer shell and the rear edge of the forward conical surface 35. Thus, there is no possibility of any edge effect causing any interference with the rise of the ink in the filler device. Moreover, as will be seen, even the rear edge of the conical surface does not cause any interruption in the forward movement of the ink meniscus.

In filling a pen utilizing the filler device of the present invention, the rear section of the pen casing (not shown) is removed from the pen and the filler device assembled with the rear end of the outer shell in the position shown in FIG. 3. It will be noted that the housing is inserted in the filler device to a sufficient extent to cause the exposed portions of the filler valve 20 (or at least one of such portions) to engage the forward inner edge and a portion of the forward surface of the forward sponge. The forward sponge 33 is distorted until its rearward face abuts the forward conical surface 35 and the sponge is slightly compressed. The shape and dimension of the conical surface 35 is such that it approximates the shape of the corresponding portion of the rear end of the housing 17 so that the forward sponge is uniformly compressed. It is desirable that the forward sponge be under slight compression, but not so great a compression as would interfere with the absorption of ink thereby or with the entry of ink into the filler valve.

When the filler valve is brought into contact with the forward sponge, the ink in the filler valve, or at least a portion thereof, is transferred from the filler valve to the forward sponge. This permits air to pass into the pen housing from the space in the filler device rearwardly of the rear end of the housing and through the openings 24 in the end plug and into the space rearwardly of the feed bar. The air can thus pass out of the pen and there is no interference with the entry of ink into the filler device when the latter is immersed in a supply of ink. Thus it will be seen that the filler device in effect "opens" the filler valve when the filler device is applied to the pen and the forward sponge is brought into contact with the filler valve.

It will thus be seen that the pen may be filled by immersing the assembled pen and filler device in a supply of water up to a level just above the rear end of the capillary filler element. The water rises in the rearward sponge and picks up ink concentrate and thus forms ink and such ink then rises in the space between the sponges and passes into the pen through the openings 19 and through the valve 20 and the openings 24 and into the capillary spaces in the capillary filler element. The air is forced ahead of the ink surface along the path just above described and passes out of the pen through the control passage 16 and the feed grooves 15. Owing to the fact that there are no sharp edges between the rear end of the filler device and the forward sponge, any edge effect which would impede the movement of the meniscus is eliminated.

After the pen has been filled, the filler device is removed from the housing 17 and the rear section (not

shown) is reassembled with the front section of the pen and the pen is then in condition for use.

A second embodiment of the invention is shown in FIG. 7 to which reference now is made. In this form of the invention, the filler device 40 is generally similar to the device 30 shown in FIGS. 1 to 3 and hence will not be described in detail. The filler device 40 has a casing 41 generally similar to the casing 31 above described. However, the casing 41 is provided with a skirt 42 of tubular form which is integral with the main body of the casing which skirt is spaced radially from and extends to forwardly of the forward end of the main body of the casing 41.

When the filler device 40 is applied to the end of a pen in this manner, illustrated in FIG. 3 in connection with the first form of the device, the skirt 42 is spaced from the rearward end of the pen. Because of this, and because the skirt extends forwardly beyond the end of the main body of the casing 41, the hands of the user are protected from being smeared with ink, as might otherwise happen were the skirt not provided.

Because of the provision of the outer skirt, which provides the necessary strength, it is possible to make the main body with a thinner wall construction and thus provide more flexibility in the main body than in the first form of the invention. This permits the main body to adapt itself to pens of slightly varying sizes without sticking or breaking.

It will be understood that while the present invention has been shown and described in connection with a pen having a capillary reservoir which reservoir fills itself by capillary action, the invention may be employed with pens having other types of filler means but provided with a filler valve adapted to hold ink in the pen and to be opened to permit the pen to be filled through the filler valve.

I claim:

1. A filler device for a fountain pen comprising a tubular casing, a forward, absorbent element in said casing, and a second absorbent element spaced rearwardly from said first absorbent element and having an ink concentrate carried thereby.

2. A filler device as set forth in claim 1 wherein a tubular spacer is disposed in said casing between said absorbent elements.

3. A filler device as set forth in claim 1 wherein a

tubular spacer is provided in said casing between said absorbent elements and has a generally conical surface facing forwardly.

4. A filler device for use with a fountain pen of the type having a capillary unit including a housing having an opening in its rear end, a capillary reservoir in said housing, and a filler valve at the rear end of the capillary reservoir formed of a material of greater capillarity than said reservoir, said filler device including a tubular casing dimensioned to receive the end of said unit and having therein a first absorbent element and positioned to abut the end of said capillary unit and to engage said filler valve and a second absorbent element spaced rearwardly from said first absorbent element and having an ink concentrate therein.

5. A filler device as set forth in claim 4 wherein a tubular abutment is provided between said absorbent elements having a forwardly facing surface positioned to be engaged by said forward absorbent element when said unit is inserted in said casing and pressed against said forward absorbent element.

6. A filler device as set forth in claim 4 wherein a tubular abutment is provided between said absorbent elements and has a forward surface shaped to conform generally with the rear end of said housing.

7. A filler device as set forth in claim 4 wherein a tubular abutment is provided between said absorbent elements and is formed with a rearwardly facing convergent, interior surface free of sharp edges and a forwardly facing divergent generally conical interior surface.

8. A filler device for use with a fountain pen of the type having an ink reservoir formed with a filling opening and a filler valve adapted to close said filling opening, said filler device comprising a tubular casing adapted to receive the end of said pen, an absorbent element in said casing adapted to contain an ink concentrate and means carried by said casing for engaging and opening said filler valve when said pen is inserted in said casing to a predetermined extent.

References Cited in the file of this patent

UNITED STATES PATENTS

2,879,744	Goldman	Mar. 31, 1959
2,935,044	Wittnebert et al.	May 3, 1960