June 3, 1941. A. W. DOUX 2,243,856

FOUNTAIN PEN

Filed May 6, 1940

Fig. 1.

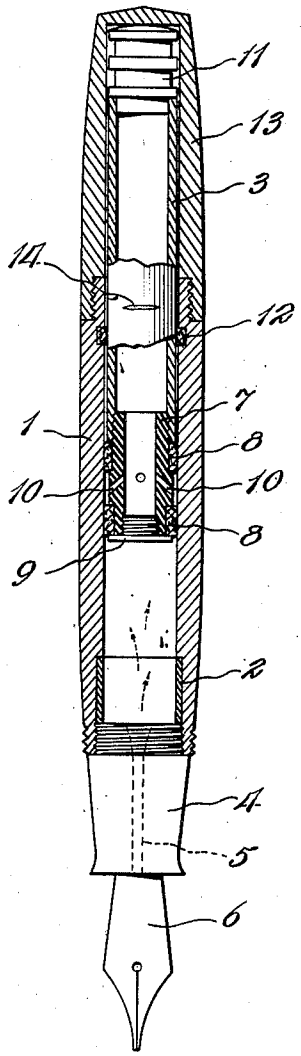
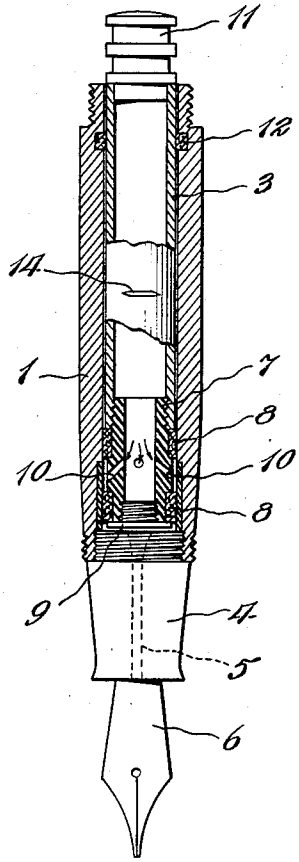


Fig. 2.



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Patented June 3, 1941

2,243,856

UNITED STATES PATENT OFFICE

2,243,856

FOUNTAIN PEN

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Application May 6, 1940, Serial No. 333,651

10 Claims. (Cl. 120—42)

This invention relates to improvements in fountain pens of the type designed to hold concentrated liquid ink, or similar coloring matter, and to form writing ink through mixture of a smaller quantity of the concentrated ink and a solvent, such as water.

The principal objects of the invention are to provide a fountain pen of the type mentioned which is of simple construction, durable, and which may be inexpensively manufactured.

These and other objects are attained by the invention illustrated in the accompanying drawing in which—

Figure 1 is a cross sectional view showing the fountain pen ready for writing and the concentrated ink container in a higher position.

Figure 2 is a cross sectional view showing the concentrated ink container in its lowest position.

The fountain pen according to this invention consists in a casing 1 which operates as a piston chamber and which contains writing ink when the fountain pen is ready for use. The casing 1 has an increased internal diameter at its lower end to receive a ring of highly absorbent material 2. The internal diameter of the ring of absorbent material 2 forms a true or even surface with the internal diameter of the remainder of the casing 1 so that a concentrated ink container 3 can be moved smoothly as a piston through the entire length of the casing 1. The ring of absorbent material 2 is held in place by the boss formed by the decreased internal diameter of the upper part of the casing 1 and by a removable base 4, in which there is a conduit 5 for the passage of ink from the casing 1 to the usual pen nib or writing point 6.

The absorbent material 2 is preferably burnt kieselguhr. The kieselguhr is formed in the shape of a split ring and subjected to pressure and heat sufficient to produce a coherent mass which is highly absorbent. The split ring is elastic and, although it can be easily inserted in the space provided by the increased internal diameter of the casing 1, it will fit tightly. Instead of kieselguhr, however, graphite or similar porous material could be used. Pumice, with an oil binder, could also be utilized as the absorbent but would have to be painted in the space provided for it.

The concentrated ink container 3 is preferably made of transparent material so that the amount of concentrate may be seen without removing the container 3 from the casing 1. It is preferable to allow a little space between the external diameter of the container 3 and the internal diameter of the casing 1 so that these parts do not rub when moved relative to each other. A spout 7 is internally threaded to the bottom of the container 3 and is of the same external diameter except for sections of reduced external diameter to accommodate rings of resilient material 8, such as cork, as shown in the drawing. The rings 8 have a greater external diameter than the container 3 and exert pressure against the inner wall of the casing 1 so that slight force is needed to move the container 3 and to provide the effect of a piston. These rings 8 are not needed, of course, if the container 3 is of sufficient diameter to fit closely in the casing. A plug 9 is internally threaded to the spout 7 to close the container 3 and to hold the bottom one of the rings 8 in place. The other of the rings 8 is held in place by the container 3 and the boss formed by the spout 7 where its diameter is equal to that of the container 3. One or more, preferably several, sloping conduits or openings 10 are provided in the spout 7, as shown in the drawing, to permit the passage of concentrated ink from the container 3. The conduits or openings 10 slope downwardly to assist the passage of the concentrate in the preferred construction. The container 3 could be closed at the bottom and provided with openings and a resilient ring or rings, if desired, but it is better to use a spout 7 since it is then simpler to provide for the downward slope of the conduits or openings 10 and the resilient rings 8.

The top of the container 3 is provided with a removable stopper 11 to permit the container 3 to be filled without removing it from the casing 1. This stopper 11 also serves as a handle for moving the container 3 relative to the casing 1. A cloth ring 12 may be provided within the upper part of the casing 1 to wipe any concentrate or writing ink from the container as it is drawn upward in the casing 1. The cloth may be fixed to a ring of suitable material and threaded in the upper part of the casing 1 so that replacement can be made easily. A cap 13 removably attached to the casing 1 protects the container 3 from being moved accidentally or damaged. A further cap, not shown in the drawing, may be used to protect the writing point when the fountain pen is not in use and may be placed over the cap 13 when the fountain pen is in use.

The container 3 may be filled when in any position within the casing 1 but a marker 14 is provided as shown to indicate the extent to which the container may be drawn upward without taking it out of the casing 1. In producing

writing ink, the container 3 is lowered, as shown in Figure 2, so that the openings 10 are at a level with the absorbent material 2. The absorbent material 2 takes up a quantity of the concentrate and, with the writing point immersed in water or the like, the container is drawn up until the marking 14 is visible. This action draws the solvent into the casing 1 and automatically forms writing ink. The mixture of the writing ink will be predetermined by the size and material of the absorbent, the capacity for solvent in the casing 1, and the ingredients of the solvent and concentrated ink.

In drawing the solvent into the casing 1 it will be apparent that some solvent will remain in the conduit 5 and on the writing point 6. This solvent will not mix in a reasonable time with the concentrated ink to produce writing ink. For the purpose of freeing the fountain pen of this solvent, the cap 13 is made shorter than that part of the container 3 and the stopper 11 which extend out of the casing 1 when the marker 14 is visible. The cap 13, in being thrust or screwed on to the casing 1, exerts slight pressure against the stopper 11 and depresses the container 3, expelling the solvent which will not readily mix with the concentrated ink. The pen is then ready for use as shown in Figure 1.

It is apparent that the fountain pen is made of parts which are easily manufactured and may be made in standard sizes and material. The fountain pen is assembled in such manner that any worn part may be readily removed and replaced. The maximum space for concentrated ink and for writing ink is provided owing to the fact that the fountain pen is of a simple mechanical nature and the container is operated as a piston by slight manual pressure. Many modifications may be made without departing from the spirit and scope of the invention which is defined in the appended claims.

I claim:

1. In a fountain pen, a writing element, a casing joined to said writing element and having an increased internal diameter at one end, a concentrated ink container movable axially as a piston within said casing and provided with openings to permit the passage of concentrated ink, absorbent material in the increased internal diameter in said casing to take concentrated ink when said container is in a low position in said casing and to mix said concentrated ink with solvent, which is drawn into said casing by the upward movement of said container automatically to form writing ink.

2. In a fountain pen, a writing element, a casing joined to said writing element and having an increased internal diameter at one end, a concentrated ink container movable axially as a piston within said casing and provided with openings to permit the passage of concentrated ink, one or more bands of flexible material about the circumference of said container, absorbent material in the increased internal diameter in said casing to take the concentrated ink when said container is in a low position in said casing and to mix said concentrated ink with liquid solvent, which is drawn into said casing by the upward movement of said container, automatically to form writing ink.

3. In a fountain pen, a writing element, a casing joined to said writing element and having an increased internal diameter at one end, a concentrated ink container movable axially as a piston within said casing and provided with openings to permit the passage of concentrated ink, absorbent material in the increased internal diameter in said casing and forming a true surface with the inner wall of said casing to take concentrated ink when said container is in a low position in said casing and to mix said concentrated ink with solvent, which is drawn into the casing by the upward movement of said container, automatically to form writing ink.

4. In a fountain pen, a writing element, a casing joined to said writing element and having an increased internal diameter at one end, a concentrated ink container movable axially as a piston within said casing and provided with openings to permit the passage of concentrated ink, one or more bands of flexible material about the circumference of said container, absorbent material in the internal diameter in said casing and forming a true surface with the inner wall of said casing to take concentrated ink when said container is in a low position in said casing and to mix said concentrated ink with solvent, which is drawn into the casing by the upward movement of said container, automatically to form writing ink.

5. In a fountain pen, a writing element, a casing joined to said writing element and having an increased internal diameter at one end, a concentrated ink container movable axially as a piston within said casing and provided with openings to permit the passage of concentrated ink, a ring of burnt kieselguhr in the increased internal diameter of said casing to take concentrated ink when said container is in a low position in said casing and to mix said concentrated ink with solvent, which is drawn into said casing by the upward movement of said container, automatically to form writing ink.

6. In a fountain pen, a writing element, a casing joined to said writing element and having an increased internal diameter at one end, a concentrated ink container movable axially as a piston within said casing and provided with openings to permit the passage of concentrated ink, a ring of burnt kieselguhr in said casing and forming a true surface with the inner wall of said casing to take concentrated ink when said container is in a low position in said casing and to mix said concentrated ink with solvent, which is drawn into said casing by the upward movement of said container, automatically to form writing ink.

7. In a fountain pen, a writing element, a casing joined to said writing element and having an increased internal diameter at one end, a concentrated ink container movable axially as a piston within said casing, a spout removably attached to the bottom of said container and having one or more downwardly sloped openings to permit the passage of concentrated ink, absorbent material in the increased internal diameter in said casing to take concentrated ink when said container is in a low position in said casing and to mix said concentrated ink with solvent, which is drawn into said casing by the upward movement of said container automatically to form writing ink.

8. In a fountain pen, a writing point, a casing joined to said writing element and having an increased internal diameter at one end, a concentrated ink container movable axially as a piston within said casing, a spout removably attached to said container and having one or more downwardly sloped openings, one or more removable rings of resilient material about the

circumference of said spout, absorbent material in the increased internal diameter in said casing to take concentrated ink when said container is in a low position in said casing and to mix said concentrated ink with solvent, which is drawn into said casing by the upward movement of said container automatically to form writing ink.

9. In a fountain pen, a writing point, a casing joined to said writing element and having an increased internal diameter at one end, a concentrated ink container movable axially as a piston within said casing, a spout removably attached to said container and having one or more downwardly sloped openings, one or more removable rings of resilient material about the circumference of said spout, a ring of burnt kieselguhr in the increased internal diameter of said casing to take concentrated ink when said container is in a low position in said casing and to mix said concentrated ink with solvent, which is drawn into said casing by the upward movement of said container automatically to form writing ink.

10. In a fountain pen of the piston type, the combination of a concentrated ink container having a marking element to determine the height to which said container shall be raised when drawing solvent into the pen with means for depressing said container to a lower position in order to expel the solvent which will not readily mix with the concentrated ink.

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