

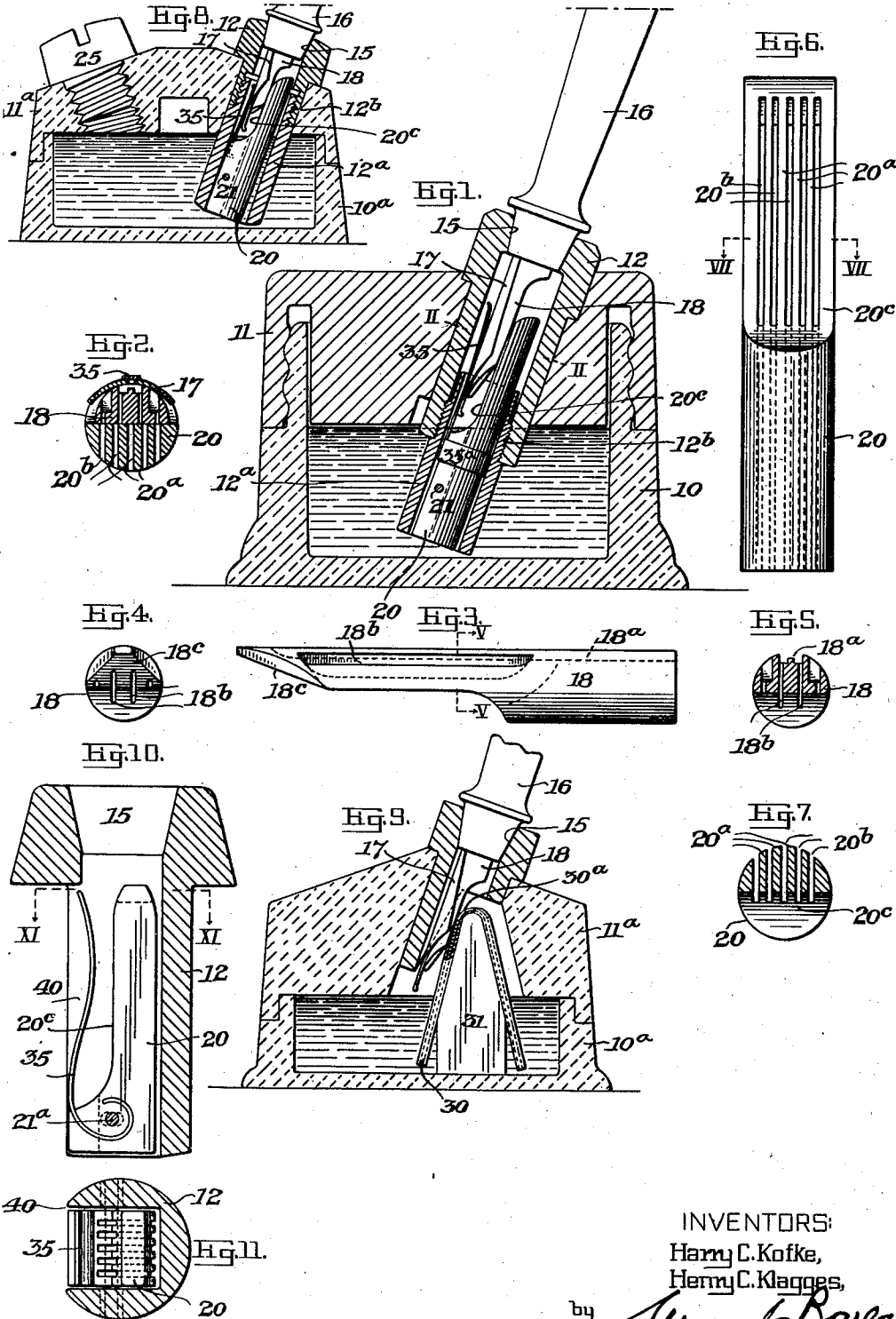
Dec. 15, 1942.

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2,304,832

INK FEEDING MEANS FOR WRITING PENS

Filed Aug. 3, 1940



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UNITED STATES PATENT OFFICE

2,304,832

INK FEEDING MEANS FOR WRITING PENS

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Application August 3, 1940, Serial No. 350,320

13 Claims. (Cl. 120—4)

This invention relates to writing equipment, including writing pens of the so-called "dipless" type which include ink fountains or reservoirs in direct association therewith, and ink-supplying means with which such pens and their fountains may be associated when not employed in the act of writing.

Pens of this type are provided with fountain feed means or reservoirs designed to hold a liberal supply of ink from a single dipping; such reservoir means being usually in the form of a recessed bar resembling and/or substantially like the feed of a fountain pen. Such bar may have the usual air channel directly underlying the pen point and, additionally, will have grooves, recesses, or spaces which hold a liberal supply of ink from a single dipping. The ink which enters this fountain or reservoir feeds by capillary action to the pen or pen point, and thence to the writing tip end of the same when in the act of writing.

In the use of pens of this type the usual practice is to dip them in a body of ink in order that the fountain or reservoir may be supplied. When such pens are not being used for writing they are usually placed in a holder and supported in such manner that the pen and the feed are immersed in the ink supply; remaining in this position until removed for actual use. Since the pen and feed assembly is designed to take up and hold a relatively large supply of ink, it is not unusual, in certain circumstances—such as a high ink level within the container, or long immersion in any ink supply—that they will take up, while in the ink, more ink than can be retained by the pen and feed assembly after removal from the ink supply. As a result they will drop ink when removed from the supply or will write with a very heavy stroke and, in general, give unsatisfactory service. Further objections to this dipping or immersion method of supplying ink to the pen and feed assembly consist in the collection of dried ink residue on the upper and exposed portions of the pen point or nib and the feed; heavy incrustation on the lower end of the penholder which transmits ink to the fingers, and a collection of ink and ink residue around the mouth of the ink well which is also transferred to the lower end of the penholder and thence to the fingers when the pen equipment is being employed for writing purposes.

One object of the present invention is to obviate the difficulties heretofore met with in the use of writing equipment of this type and to provide a form of equipment in which the sup-

ply or charge of ink is received directly and wholly within the fountain or reservoir provided by the feed-bar; the pen point associated therewith being kept out of the ink supply and then, when in use in the writing position, receiving the necessary supply of ink for writing purposes wholly from the fountain feed-bar under the usual capillary action.

A further object of our invention is to provide an ink receptacle and supporting means carried thereby for the pen assembly of such character that the pen point will be maintained at all times out of direct contact with the ink, even when the ink receptacle is entirely filled.

A further object of our invention is to provide an improved form of fountain or reservoir feed-bar for association with the pen point and particularly applicable for cooperative use with capillary ink-feeding means associated with the ink supply; such improved feed-bar having a series of narrow slits or slots, which may be longitudinally disposed, providing capillary spaces or surfaces. A plurality of the longitudinal slits or slots so provided are preferably in communication with the air channel on top of the feed-bar and directly underlying the pen point, if present.

And a still further object of our invention is to supply the feed-bar fountain or reservoir associated with the pen point with a charge of ink from a series of capillary spaces or surfaces located within and delivering ink from a suitable receptacle. While many different forms of capillary elements may be provided, we have developed one very satisfactory form by slotting or grooving a rod or stem of suitable material and of proper size and shape to form plate-like members in parallel relation and uniform spacing, and mounting the same in such position with respect to a supply of ink that its lower end dips in the same. The opposite and delivery end of this capillary element directly underlies the capillary feed element or reservoir of the pen equipment when the latter is applied thereto or when left within a pen-receiving socket for contact with the element providing such capillary ink-supplying spaces.

These and other features of our invention are more fully set forth hereinafter; reference being had to the accompanying drawing, more or less diagrammatic in character, in which:

Figure 1 is a view in cross-sectional elevation of writing equipment within the scope of our invention.

Fig. 2 is a sectional view on the line II—II, Fig. 1.

Fig. 3 is a view in elevation, on a larger scale, of the feed-bar associated with the pen point of the penholder portion of our improved writing equipment.

Fig. 4 is an end view of the feed-bar shown in Fig. 3.

Fig. 5 is a sectional view on the line V—V, Fig. 3.

Fig. 6 is a view in elevation, on a larger scale, of one form of capillary element within the scope of our invention.

Fig. 7 is a sectional view on the line VII—VII, Fig. 6.

Figs. 8 and 9 are sectional views illustrating other forms of writing equipment within the scope of our invention.

Fig. 10 is a sectional view illustrating another form of capillary element and its support, and

Fig. 11 is a sectional view on the line XI—XI, Fig. 10.

Our invention comprises a capillary ink-supplying element arranged to dip in a body of ink; such element having capillary spaces in which ink rises for cooperation with a pen point and a fountain feed-bar assembly carried by a suitable penholder and associated therewith; the fountain feed-bar lying in contact with the capillary element and receiving ink therefrom.

In Fig. 1 of the drawing an ink container is illustrated at 10, having a removable cover 11, which may be in threaded engagement therewith. The cover is apertured to receive a hollow plug or stem 12, disposed diagonally with respect thereto and the upper end of this plug has a socket 15 for the reception of the end of a penholder 16, carrying a pen or pen point 17, and a fountain or reservoir feed-bar 18; such socketed plug being disposed at an oblique angle with respect to the base provided by the ink receptacle so as to present the penholder in convenient position for removal from or introduction into such socket. By preference the socket has a flaring mouth in which the tapered end of the penholder fits. If desired, such mouth may be recessed for the passage of air.

The plug 12 is preferably in two parts; a lower end 12^a being in threaded engagement with the upper part, and such lower end dips into the supply of ink within the well. Mounted within this section 12^a is a capillary element 20. In the present instance this element comprises a plurality of plate-like parts 20^a arranged in suitably spaced relation and providing a series of capillary spaces 20^b in which ink may rise from the supply in the well 10 in which such capillary element dips. While there are many ways within the scope of our invention for providing the desired capillary spaces we have, for convenience, provided them by slotting a rod of suitable material to provide the plate-like parts 20^a in spaced relation.

By preference, the element 20 is spaced from the inner wall of the section 12^a and it may be secured thereto by a pin 21, upon which it may have slight rocking movement. The element 20 is disposed in a position substantially as illustrated in Fig. 1, and the upper portion is cut away at 20^c to provide space for the disposal of the fountain-feed-bar 18, which is in contact with the surface of such cut away portion for the transfer of ink therefrom to the capillary spaces of its fountain or reservoir.

The fountain or reservoir feed-bar 18 carried by the penholder and associated with the pen point 17 may have the usual air channel 18^a underlying the pen point and, in addition, a series

of slots, grooves or spaces 18^b disposed longitudinally of the same; some or all of such slots or spaces extending to and through the beveled wall portion 18^c at the forward end of the same. The slots or spaces of the fountain feed bar are preferably parallel with the grooves or spaces of the capillary element dipping within the ink supply and when the parts are associated in the manner illustrated in Fig. 1, there will be a proper transfer of ink from the capillaries of the element 20 to the capillaries of the feed-bar 18; the latter being so constructed and arranged as to provide a fountain or reservoir carrying a liberal supply of ink which will be distributed to the pen point 17 and thence to the writing tip end of the same when the latter is in use.

By preference the slits or slots formed in the fountain or reservoir feed-bar are narrower than the spaces between the plate members of the capillary element disposed in the ink supply.

The end of the fountain feed-bar may be beveled at 18^c with respect to the pen point, and the parts of our improved writing pen assembly are so proportioned and arranged that when the end of the penholder with the pen is introduced into the socket of the plug 12, the under surface of the fountain feed-bar will lie in contact with the capillary element 20 and receive ink therefrom. In this position the pen point is above the supply of ink in the well and wholly out of contact therewith.

While we have shown a plug element providing a socket for the end of the penholder, with a separate section at its lower end carrying the capillary element and threaded into the upper section at 12^b, it is within the scope of our invention to make the plug in one piece. A plurality of parts facilitates assembly of this particular form of construction and in addition it facilitates cleaning of the capillary element.

As it is desirable, in the use of our improved ink supplying means, that the pen or pen point shall not dip in the ink but shall receive its supply wholly through the capillary means provided, the inkwell should be of such character that, even when filled, the level of ink will be below the end of the pen point. In the form of structure illustrated in Fig. 1, the capillary element mounted in the inkwell is supported by the hollow plug 12 carried by the removable cover 11, and the latter is constructed so as to extend into the inkwell a sufficient distance to cut down the capacity thereof and insure that when full the level of ink will be below the end of the pen point. In this form of structure the inner wall of the well may have a ledge or a mark that will indicate the amount of ink to be placed in the same. In this particular form of well the cover is to be removed for filling.

Other forms of ink receptacles may be employed and other forms of hollow plug-like members receiving the capillary element and providing for the support of the pen equipment in such relation to the same that the pen point is at all times above the ink supply with the fountain feed-bar in contact with the capillary ink-supplying element. And such inkwells will be so proportioned with respect to the mounting for the pen equipment as to insure that the pen point will be maintained at all times out of contact with the body of ink therein, even when the inkwell is completely full.

In Fig. 8 we have illustrated a form of well which is substantially in one piece. It is initially made in two sections 10^a and 11^a, subsequently

permanently secured together. The top has an opening receiving the hollow plug carrying the capillary element and, in addition, is provided with a filling opening closed by a removable plug 25, which may be threaded. The plug 25 has a notch 25^a adapted to receive a coin whereby it may be turned.

The ink-receiving space of the well shown in Fig. 8 is such that the level of ink within the same is determined by the thickness of the upper wall of the well at the filling opening and it will be understood that when filling the well, the ink should not rise above the under side of such wall. With such a supply, as may be readily observed, the level of ink will be below the pen point. In this form of our improved device the capillary element dipping in the ink is shorter than that illustrated in Fig. 1.

With an inkwell of the type illustrated in Fig. 8 there is no danger of ink spilling from the same should it accidentally upset and as such well has a broad base there is little danger of it upsetting. Should an accident occur, however, no ink will be spilled. While we have shown an independent filling opening in the type of inkwell shown in Fig. 8, it is within the scope of our invention to utilize the opening receiving the hollow plug 12 as the filling opening. To facilitate insertion and removal of the member closing the filling opening, it may be threaded into the top wall of the inkwell.

Other forms of capillary ink-feeding means are within the scope of our invention and in Fig. 9 we have shown a form of inkwell in which capillary tubes are employed. These tubes, indicated at 30, may be in the form of flexible material—rubber, for instance—and may be laid over an abutment or post 31 within the well; such tubes being cut away at 30^a so that ink rising within the same will be exposed for transfer to the capillary feed-bar associated with the pen point. This well may be in two parts, as illustrated, which parts will be cemented together as in the form of structure illustrated in Fig. 8. The opening in the top receiving the hollow plug carrying the capillary element may be removed when it is desired to fill the inkwell, or an independent opening may be formed in the top of the well and closed by a removable plug as in the form of inkwell illustrated in Fig. 8.

While it may not be necessary in practice, it is within the scope of our invention to provide a light spring finger in engagement with the back of the pen point so that sufficient pressure may be applied through the same to the fountain feed-bar and insure that the latter will engage the capillary surface in the manner illustrated in Fig. 1. This spring finger, shown at 35, may be carried by the capillary element 20; being provided with a tubular portion 35^a embracing the same. The same form of spring may be employed with the form of structure illustrated in Fig. 8. In view of the resiliency of the rubber tubing employed in the structure illustrated in Fig. 9, it may not be necessary to employ a spring.

In the form of our invention illustrated in Fig. 9, the plug carrying the penholder is a single piece, since the capillary means are supported wholly within the well. It is, however, within the scope of our invention to provide a supporting plug for the capillary element of one piece, and this is shown in Figs. 10 and 11. This plug is adapted to fit the opening of the inkwell and present the capillary element in proper position for engagement with the feed-bar when the pen-

holder is inserted in the socket thereof. In this form of device, one side of the plug is entirely open, as indicated at 40. The capillary element may be square, as illustrated, and it carries the spring finger 35, which may be connected in the manner indicated. This element is connected to the plug by a pin 21^a, and the openings in the wall of the plug receiving the pin are large enough to provide a loose fit, so that the capillary element may move readily with respect to the plug in which it is mounted. This structure functions in a manner exactly similar to those shown in Figs. 1 and 8. It will be noted that the spring of this structure is toward the open side of the plug. If desired, the position of the capillary element may be exactly reversed in the plug, by bringing the capillary element toward the open side of the plug, without departing from our invention.

While we have found it practicable to provide capillaries presenting an ink-supply for contact with the fountain feed-bar of the pen equipment by slotting a rod of suitable material, which may be hard rubber, in the manner illustrated, wherein it will be noted that the slotting is at one side only and that a portion is cut away to expose the spaces between the plate-like portions produced by the slotting operation, thereby providing a surface for engagement with the fountain feed-bar, other forms of capillary elements are within the scope of our invention. For instance, individual plates in parallel relation, properly spaced, and of the shape illustrated in the several views of the drawing may be carried by the hollow plug 12, or by a support fitting the same, in proper position to cooperate with the fountain feed-bar of the penholder assembly.

It will be understood that the constructions herein described, and shown in the accompanying drawing are for illustrative purposes only and that modifications may be made therein without departing from the spirit of our invention, all of which is deemed to be within the scope of the appended claims.

We claim:

1. The combination with an inkwell having a body of ink, of a capillary element mounted in said inkwell; said capillary element providing surfaces or spaces in which ink may rise, and a writing pen assembly including a pen point and a fountain feed-bar associated therewith; said feed-bar only overlying and contacting with said capillary element and receiving ink charges therefrom.
2. The combination with an inkwell having a body of ink, of a plurality of plates in parallel arrangement mounted in said inkwell; said plates dipping in said ink and providing capillary spaces in which ink may rise, and a writing pen assembly including a pen point and a fountain feed-bar associated therewith; said feed-bar only overlying and contacting with said spaced plates and receiving ink therefrom.
3. The combination, with an ink supply, of a capillary element including a plurality of members in spaced relation dipping in the ink supply and providing capillary spaces in which ink may rise, and a writing pen assembly including a pen point and a fountain or reservoir feed-bar; said pen point being positioned above the ink supply and said feed-bar contacting with said capillary element and receiving ink therefrom.
4. The combination, with an ink supply, of a capillary element including a plurality of thin

plates in parallel relation providing capillary spaces; said plates dipping in the ink supply from which such capillary spaces fill, and a writing pen assembly including a pen point and a fountain or reservoir feed-bar; said feed-bar having longitudinal slots parallel with the spaces provided by the plates of the capillary element and in contact therewith and receiving ink therefrom.

5. The combination, with an ink supply, of a slotted element having capillary spaces and dipping in said ink supply, and a writing pen assembly including a pen point and a fountain feed-bar associated therewith; said feed-bar only lying in contact with said capillary element and receiving ink therefrom.

6. Means for supplying ink to a writing pen fountain feed-bar comprising a penholder, a pen point and feed-bar assembly associated with said penholder; said feed-bar having capillary spaces and forming a fountain element, an ink reservoir, and a capillary structure mounted in said ink reservoir to engage the fountain element only of the pen and feed-bar assembly above the level of ink in said ink reservoir.

7. The combination with an ink receptacle having a filling opening and a body of ink therein, of a removable socketed member closing the opening to said ink receptacle, a capillary element carried by said closing member and dipping in the body of ink, and a writing pen assembly including a penholder, a pen point and a fountain feed-bar associated with said pen point mounted in said socket; said feed-bar only lying in contact with the capillary element and receiving ink therefrom.

8. The combination with an ink receptacle having a filling opening and containing a supply of ink, of a removable socketed member closing said opening, a capillary element carried by the closing member and dipping in the body of ink, and a writing pen assembly including a penholder, a pen point and a fountain feed-bar associated with such pen point mounted in the socket; said feed-bar lying in contact with the capillary element and receiving ink therefrom and the pen

point being positioned out of contact with the ink within the ink receptacle.

9. In a structure as set forth in claim 3, a spring member for pressing the fountain feed-bar against the surface of the capillary element.

10. The combination with an inkwell having a body of ink, of a capillary element mounted in said inkwell and dipping in said body of ink; said capillary element providing spaced surfaces on which ink may rise, and a writing pen assembly including a pen point and a fountain feed-bar associated therewith; said feed-bar only overlying and contacting with said capillary element.

11. The combination with an inkwell having a body of ink, of a capillary element mounted in an inclined position in said inkwell and dipping in said body of ink; said capillary element providing spaced surfaces on which ink may rise, and a writing pen assembly including a pen point and a fountain feed-bar associated therewith; said feed-bar only overlying and contacting in parallel relation with said capillary element.

12. The combination with an inkwell having a body of ink, of a plurality of plates in parallel arrangement mounted in said inkwell; said plates dipping in said ink and providing capillary spaces in which ink may rise, and a writing pen assembly including a pen point and a fountain feed-bar having longitudinal capillary slots associated therewith; said feed-bar only overlying and contacting with said spaced plates and receiving ink in its capillary slots therefrom.

13. The combination with an inkwell having a body of ink, of a plurality of plates in parallel arrangement mounted in an inclined position in said inkwell; said plates dipping in said ink and providing capillary spaces in which ink may rise, and a writing pen assembly including a pen point and a fountain feed-bar having longitudinal capillary slots associated therewith; said feed-bar only overlying and contacting with said spaced plates in parallel relation and receiving ink in its capillary slots therefrom.

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