

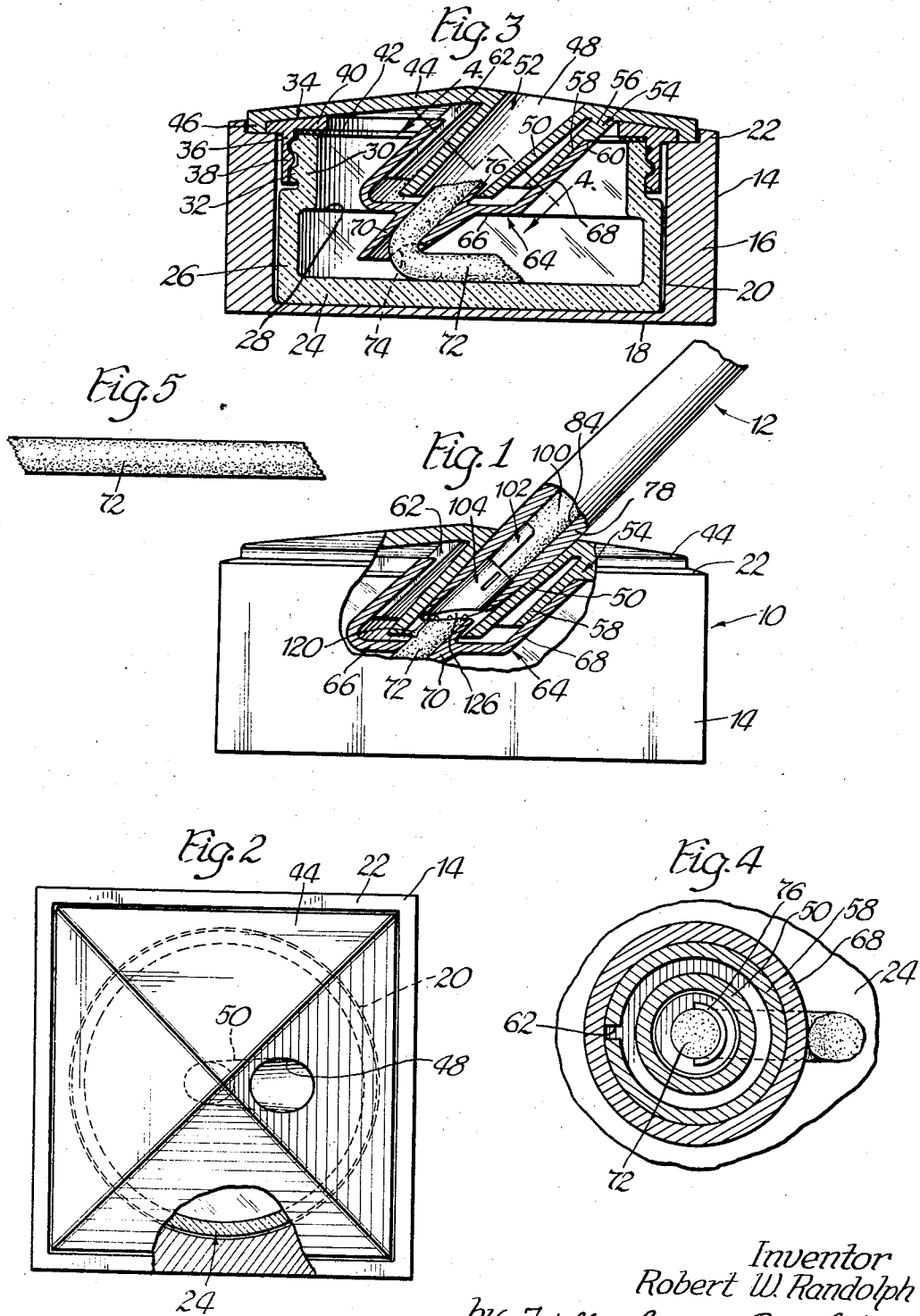
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BASE FOR FOUNTAIN PEN DESK SET

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**BASE FOR FOUNTAIN PEN DESK SET**

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5 Claims. (Cl. 120—57)

This invention relates to a pen desk set of the type including a pen and a base having an ink well, and has to do particularly with a base for such a set wherein a pen inserted in the base receives ink from the ink well by capillary action exerted by a capillary ink lifting element forming a portion of the base.

An object of the present invention is to provide a novel pen desk set base wherein ink is supplied to a pen inserted therein by capillary action and is drawn into the pen by capillary action when the pen is in place in the base.

A further object is to provide a base for use with a pen of the character referred to which base has a capillary ink lifting element of such character and so arranged in the base as to be effective to supply ink to a pen inserted therein so long as any ink remains in the base.

Another object is to provide a pen desk set base capable of being made and assembled very inexpensively, is rugged and durable and is not likely to become inoperative over a long period of use.

Other objects are to provide a base or well for a pen desk set wherein the ink is maintained against leaking or spilling in all positions of the base; evaporation of the ink is maintained at a minimum; ink is always available for supply to a pen so long as any ink remains in the base; ink is automatically withdrawn into a pen from the supply in the base whenever the pen is inserted in the base in incompletely filled condition.

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

Figure 1 is a side elevational view of the desk set of my invention with portions of the base and pen broken away to show internal details;

Fig. 2 is a top plan view of the base of Fig. 1 with a portion broken away and shown in section;

Fig. 3 is a vertical sectional view of the base;

Fig. 4 is an enlarged sectional view taken along the line 4—4 of Fig. 3;

Fig. 5 is a side view of the capillary ink lifting element.

Referring now in detail to the drawings, the pen desk set is shown as a whole in Fig. 1 and includes a base or base unit 10 and a pen 12. The base includes a reservoir or well for containing a supply or quantity of ink from which the ink is lifted by capillary action to a point above the level of the body of ink in the reservoir and supplied to the pen which in turn draws ink into its interior by capillary action. The pen has a capacity for containing a substantial quantity of ink so that the pen can be used for a considerable length of time in writing without exhaustion of the supply of ink therein. When the pen is replaced in the base, it is again put in position in contact with the capillary ink lifting element in the base whereupon the pen is filled by capillary action. The capacity of the pen is substantially greater than that of a so-called dip pen such as customarily used with an ink-containing base. Hence, the pen need not be frequently

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dipped or reinserted into the base for the purpose of picking up additional ink for writing but may be used for a substantial period without refilling. The pen does not require manual manipulation for filling but fills itself whenever inserted in the base.

The present invention is directed to the base 10; the pen 12 is disclosed and claimed in my co-pending application, Serial No. 308,976, filed September 11, 1952, which is a division of the present application.

The base 10 includes a casing member 14 which, in the present instance, is polygonal in outline as viewed in plan and indicated in Fig. 2, the exterior shape of the casing member being selected for its appearance. The casing member may be of any suitable material, such as wood, plastic, or other materials and is provided primarily for the sake of ornament. The casing member includes a surrounding upright wall 16 and a bottom element 18 defining a cavity 20 which, in the present instance, is circular in plan view for accommodating an ink reservoir of similar shape. A bead or upstanding peripheral rib 22 surrounds the upper surface of the wall element 16 along the outer portion thereof.

The supply of ink in the base is contained in a reservoir or well 24 disposed in the cavity 20, the reservoir in the present instance, taking the form of a glass bottle, but it may be of any other desired material impervious to the ink contained therein. The reservoir or well 24 is also circular in plan view and includes a bottom portion 26 of substantially the same exterior diameter as the interior diameter of the cavity 20 whereby the reservoir is substantially retained against sidewise displacement but is permitted to be inserted in and removed from the casing member with facility. The bottom portion of the reservoir constitutes the portion for containing the quantity of ink, this portion terminating upwardly at a line 28 which, for convenience in referring to the reservoir, will be designated the desired normal ink level. In the practical use of the pen desk set it is desired that the level of ink not exceed the line 28 so that the pen when inserted in the base is maintained above the level of the ink whereby the pen will not dip into the body of ink but will draw ink therefrom by capillary action through the medium of a capillary ink lifting element, as will be explained more fully in detail later. The reservoir 24 includes an upper reduced diameter neck portion 30 having exterior threads 32 for purposes of securement of a thread ring 34 thereon. The thread ring includes an annular depending flange 36 having interior threads 38 threadedly engaging the threads 32 on the neck portion 30, the neck portion being of such reduced diameter that the flange 36 clears the surface of the cavity 20 of the casing member. The thread ring 34 also includes an upper annular element 40 disposed in substantially horizontal position with its outer peripheral portion disposed on the upper surface of the wall element 14 and its inner portion overlying the neck portion 30 of the reservoir. A sealing gasket 42 is interposed between the element 40 and the upper surface of the neck portion 30 for sealing the space therebetween against the flow of ink therepast, the gasket 42 being gripped in the action of threading the thread ring onto the neck portion of the reservoir. The gasket 42 may be of any desired material effective for sealing purposes. The thread ring 34 may be made up of any of a number of suitable materials, e.g., any of the well known plastics impervious to ink.

The upper surface of the thread ring 34 slopes slightly upwardly and inwardly for full-surface contact by the cover 44 which may be of material similar to that making up the thread ring 34. I prefer to make up the cover 44 of plastic for facility in molding or shaping it and the structural elements secured thereto, which will be referred to later. The cover 44 takes the shape of a

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flattened pyramid (Figs. 2 and 3), its under surface engaging the upper surface of the thread ring 34 and secured thereto by means of a suitable cement, or other desired means, so as to prevent the flow of ink therebetween. At the outer peripheral edge of the cover 44 is a downwardly extending rib or bead 46 which engages the upper surface of the wall element 14 inwardly of the bead 22 whereby a finished and pleasing appearance of the base 10 is effected.

The cover 44 is provided with an aperture 48 disposed preferably adjacent one side thereof for receiving the forward end of the pen 12. The aperture 48 is surrounded by a downwardly extending socket element 50 which is preferably molded or formed integral with the cover 44 and forms, together with the aperture 48, a socket 52 which tapers slightly in a downward direction. The taper of the socket 52 is such as to coax with the tapered forward portion of the pen 12 in such a way as to support the pen in the desired position above the level of the ink. The details of construction of the pen will be referred to later. The tubular element 50 and the socket 52 are inclined at an angle relative to the vertical so that the pen, when supported in the socket, is disposed at a convenient angle (Fig. 1) for facility in inserting the pen into the socket and removing it therefrom. The tubular element 50 terminates downwardly at a point slightly above the desired normal ink level indicated by the line 28.

Surrounding the tubular element 50 and spaced radially outwardly therefrom and also preferably formed integral with the cover 44 is an annular skirt element 54, tubular in form, extending downwardly from the cover to a point adjacent the lower end of the tubular element 50. The annular skirt element 54 includes an upper portion 56 and a reduced diameter lower portion 58 which forms a shoulder 60 with the upper portion. The annular element 54 is provided with a slot 62 at one side which is of relatively minor circumferential extent (Fig. 4) and extends vertically throughout the length of the element 54.

As mentioned above, one of the objects of the invention is to provide a base which is effective for preventing spilling of the ink in the event the base is accidentally tipped over. In this connection a trap or cap 64 is provided which cooperates with the tubular element 50 for preventing spilling of the ink, as well as serving another purpose. The tubular element 50, in addition to forming a socket for supporting the pen, therefore also serves the purpose of cooperating with the trap 64 for preventing spilling of the ink. The trap 64 furthermore constitutes means for directly mounting the capillary ink lifting element as will be explained later. The trap 64 takes the form of a cap-like or cup-like element having a bottom portion 66 and an upright wall portion 68 shaped so that when the trap is mounted on the annular element 54 it is disposed with the bottom element 66 substantially horizontal and in a position closely adjacent the desired normal level of the ink. The wall element 68 is therefore disposed at an acute angle to the bottom element 66 and is fitted over the reduced diameter portion 58 of the annular element 54 with the upper edge of the wall element 68 engaging the shoulder 60. The trap 64 may be of a material similar to that of the cover 44. Due to the slot 62 the annular element 54 possesses a certain degree of resiliency whereby the trap 64 can be readily fitted over the portion 58 of the annular element and frictionally held in position thereon. The slot 62, after fitting of the trap 64 in position, is open only at its uppermost portion adjacent the cover 44, whereby an aperture is defined, the lower portion being closed by the wall element 58. The bottom element 66 of the trap 64 is spaced a short distance below the lower end of the tubular element 50, for forming a vent passage from the socket 52 through the space between the ele-

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ments 50 and 54, through the slot 62 and into the interior of the ink reservoir.

The trap 64 as mentioned above constitutes the means for mounting and supporting the capillary ink lifting element and to this end it is provided with a tube-like portion 70 disposed at an acute angle relative to the bottom element 66 and, when the trap is fitted in position, axially aligned with the tubular element 50, namely, at an angle to the vertical. The tube-like element 70 is preferably of lesser diameter than the smallest diameter of the socket 52 so that the pen 12 will have more effective contact engagement with the ink lifting element, as will be explained later. The capillary ink lifting element 72 (Figs. 3 and 5) preferably takes the form of a cylindrical elongated porous cellulose sponge element, being made up of regenerated cellulose. The sponge material making up the ink lifting element has small capillary interstices preferably of approximately 0.005" diameter, and is yieldable and resilient for enabling it to be flexed or bent and to enable the end thereof to be slightly compressed by the pen when bearing thereon. The capillary ink lifting element 72 is mounted in position in the reservoir as illustrated in Fig. 3, the upper portion being fitted in the tube-like element 70 and the lower portion being bent at an acute angle with respect to the upper portion and lying horizontally on the bottom of the reservoir. To this end the tube-like portion 70 has a notch 74 in its lower end and on the lower side of the axis of the tube-like portion, that is, in that space defined by the acute angle between the axis of the socket and the horizontal for receiving the ink lifting element, the portion 70 extending to a position closely adjacent the bottom of the reservoir. The diameter of the ink lifting element is substantially equal to the inner diameter of the tube-like portion 70 and the element is preferably cemented therein, whereby when the element is placed in proper position, as illustrated in Fig. 3, it will be held with its upper end disposed at the desired height above the normal ink level and its lower end in horizontal position lying on the bottom of the reservoir. The notch 74 assures that the lower portion of the ink lifting element will not be displaced laterally or angularly about the axis of the upper portion from the position shown, whereby because of the inclination of the tube-like element 70 the lower portion of the ink lifting element is retained at an acute angle with respect to the upper portion and thereby more effectively retained in horizontal position against the bottom of the reservoir. Thus it is assured that the supply of ink in the reservoir will be entirely lifted by the ink lifting element.

At least one end surface of the capillary ink lifting element 72 is cut at an acute angle to the length thereof whereby, when such end surface is disposed uppermost and the element is positioned in the appropriate angular position, the end surface lies in a position adjacent the horizontal, at an angle of about 12° relative thereto, being thereby effective for proper engagement by the forward capillary end surface of the pen 12, as will be described later. Preferably the two ends surfaces of the capillary ink lifting element are formed similarly so that either end can be disposed uppermost without regard to selecting a particular end for accomplishing the purpose mentioned.

For the purpose of maintaining the extreme upper end portion of the ink lifting element in proper position, the tube-like element 70 is provided with an upstanding lip 76 projecting above the bottom element 66 of the trap and extending a short distance into the socket 52. This lip is substantially semi-cylindrical in end view (Fig. 4) and is disposed below the axis of the socket, forming a support for the upper end portion of the ink lifting element against displacement in that direction by the pen as will be referred to hereinafter. The absence of such a lip on the diametrically opposite side enables the writing point of the pen nib to extend downwardly beyond

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the upper surface of the element to enable the capillary surface of the pen to fully engage the ink lifting element.

If the base 10 should be accidentally tipped over, the ink would not spill because the ink would close the slot 62 against the passage of air therethrough and partial vacuum created in the bottom of the ink well (which would then be uppermost) would prevent the ink from rising to the level of the lower end of the tubular element 50 which would also be uppermost. Also, if the level of the ink is retained at the line 28 or below, there would be insufficient ink to reach the then upper end of the tubular element 50. When the base is tipped over, a certain portion of the ink would flow through the slot 62 and into the space between the annular element 54 and tubular element 50. When the base is thereupon again set upright, the ink thus in the trap will find its way back to the reservoir through the tube-like element 70 and, although this action may be slow, nevertheless spilling of ink out of the base is avoided. The capillary ink lifting element prevents free flow of ink through the tube-like element 70, and if in accidental tipping over of the base any ink should be trapped in the tube-like element 70 it would be prevented from flowing out by the ink lifting element 72. Evaporation of the ink in the reservoir is maintained at a minimum, the ink lifting element 72 checking evaporation and the opening 62 by its small dimensions retarding evaporation.

The pen 12 is a capillary type pen effective for drawing or lifting ink from the capillary ink lifting element 72 and possesses substantial capacity for enabling the pen to be used for a long period of time without the necessity of refilling. The pen is fully described in my copending application Serial No. 308,976, filed September 11, 1952 as a division of this application. Pen 12 includes a barrel 78 formed with a cavity or bore 84 in which is fitted filler-and-reservoir element 100. A guard 104 having a front plate 126, retains element 100 and pen nib 102 in place in the bore.

Because of the inclination of the socket 52 and the ink lifting element there is a component of force exerted by the pen on the ink lifting element in a direction toward the lip 76, and as referred to above, displacement of the upper end portion of the ink lifting element in this direction is prevented by the lip. For this reason maximum contact area between the ink lifting element and the pen is established. The writing point 120 is enabled to extend below the upper end surface of the ink lifting element and to contact the side surface of the latter, thereby establishing still greater capillary contact area between the ink lifting element and the pen.

I claim:

1. A base for a pen desk set comprising an ink receptacle, a molded cover removably secured to the receptacle in ink sealing relation therewith, said cover having an integral, downwardly extending tubular element open to the exterior for supporting a pen and terminating a substantial distance above the bottom of the receptacle and an integral downwardly extending annular element surrounding said tubular element in spaced relation thereto and extending to a position adjacent the lower end of said tubular element and having a vertical slot therein, said slot extending substantially throughout the length of the element and the portions of the element adjacent the slot having a limited degree of resilience, a molded cap removably secured to said annular element in ink sealing relation therewith and extending to a position adjacent the top of the latter, the upper portion of said slot being open to establish communication between the interior of the receptacle and annular element, said cap also having a tubular portion in line with said tubular element and extending to a position adjacent the bottom of the receptacle, and a capillary ink lifting element of yieldable resilient material having one portion in said tubular portion of the cap with its upper end extending into said tubular element and

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its other portion retained in horizontal position on the bottom of the receptacle by the lower end of the tubular portion of said cap.

2. A base for a pen desk set comprising an ink receptacle, a cover for the receptacle having a tubular element extending downwardly therefrom at an angle to the vertical and forming a socket for receiving and supporting a pen with its forward end positioned a substantial distance above the bottom of the receptacle, an outer member supported in the receptacle and having an inclined tubular portion in axial alignment with said tubular element, and a capillary ink lifting element of yieldable resilient material having an upper end portion supported in and by said tubular portion of said outer member and extending into said socket with its upper end face extending upwardly beyond the tubular portion and disposed generally transverse to the axis of the socket for engagement by the pen, and a lower end portion retained adjacent the bottom of the receptacle, said tubular portion of said outer member having an upwardly extending lip partially surrounding the upper end portion of said capillary ink lifting element substantially flush with the upper end face of the latter and disposed on the lower side of the axis thereof for supporting the upper end portion of the ink lifting element against transaxial displacement due to the weight of the pen, the ink lifting element having a circumferential portion diametrically opposite said lip exposed for engagement by the point portion of the nib of the pen.

3. A base for a pen desk set comprising an ink receptacle, a cover for the receptacle having a tubular structure inclined at an angle to the vertical and extending downwardly to a position adjacent the bottom of the receptacle, said tubular structure forming a socket for receiving the forward end of a pen and supporting the pen and having a notch adjacent its lower end on the lower side of the axis thereof, and a capillary ink lifting element of yieldable resilient material having an upper portion positioned in said tubular structure with its upper end extending into and having an exposed surface in said socket, said exposed surface including a portion constituting an end face and a portion on the circumference on the upper side of the longitudinal axis thereof, said lifting element also having a lower portion of substantial length extended through said notch and lying on and extending along the bottom of the receptacle, said notch retaining said lower portion of the ink lifting element against lateral and angular displacement whereby the portions of the ink lifting element are retained at an acute angle relative to each other.

4. A pen desk set base for receiving a pen having a capillary ink storage element at its forward end with the forward end of the element having an exposure surface inclined at such an angle to the longitudinal axis of the pen that it is disposed substantially horizontally when the pen is held at a normal writing angle and also having a writing point offset laterally from and extending forwardly of the exposed surface, said base being constructed for resting on a horizontal supporting surface and including an ink reservoir adapted to contain a supply of ink, an elongated ink lifting element of yieldable resilient material, means supporting said ink lifting element including means receiving and confining an upper end portion only of the element and extending to a position adjacent the bottom of the reservoir, the lower end portion of the element extending below the supporting means and having a substantial length disposed in horizontal position on the bottom of the reservoir and held in such position by the supporting means, and the upper end portion disposed in upright position with the upper end face of the element adjacent the horizontal and having an exposed circumferential portion adjacent the upper end face, and means defining a socket for supporting said pen inclined at such angle that when the pen is supported therein said exposure surface is disposed

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in generally horizontal position and engages the upper end face of said ink lifting element.

5. A base for a pen desk set comprising an ink receptacle, a cover for the receptacle, a tubular structure secured to the cover and extending to a position adjacent the bottom of the receptacle, and a capillary ink lifting element of yieldable resilient material supported in the receptacle and having a portion extending into said tubular structure with its upper end disposed substantially above the bottom of the receptacle, the ink lifting element being of such length that it has a lower end portion extended beyond the tubular structure, said extended portion being of substantial length and retained in position lying on and extending along the bottom of the receptacle by the lower end of said tubular structure, the upper portion of said tubular structure forming a socket for receiving and supporting a pen with the forward end of the pen in engagement with the upper end of said ink lifting element.

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