I. W. HEYSINGER.
Fountain-Pen.

No. 206,786. Patented Aug. 6, 1878.

Fig. 1.

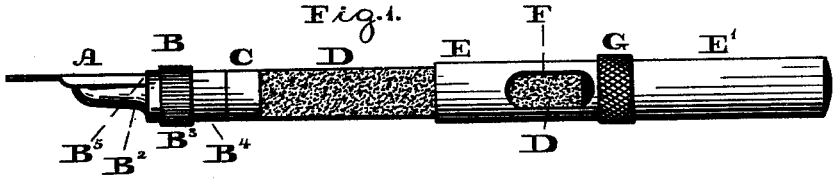


Fig. 2.

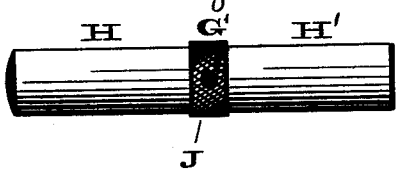


Fig. 3.

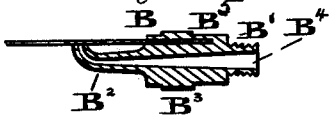
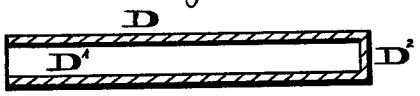


Fig. 4.

Fig. 5.



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IMPROVEMENT IN FOUNTAIN-PENS.

Specification forming part of Letters Patent No. **206,786**, dated August 6, 1878; application filed December 26, 1877.

To all whom it may concern:

Be it known that I, ISAAC W. HEYSINGER, of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented certain Improvements in Fountain-Pens, of which the following is a full, clear, and exact description, reference being had to the drawing accompanying and forming part of this specification.

Figure 1 is a view of the pen and holder, the ink-tube having been partly withdrawn from the handle, as if for replenishing. Fig. 2 exhibits the cap or cover. Fig. 3 is a sectional view of the pen-holding portion, with its various parts shown in position. Fig. 4 exhibits the binding-ferrule, and Fig. 5 is a sectional longitudinal view of the tubular ink bulb or receptacle.

The lettering in the various figures is uniform.

E E′ is a rigid tube, of light metal or other suitable material, of a size convenient for grasping in the fingers, substantially as shown in Fig. 1, the same serving as the handle of the pen-holder. About its middle, at G, it is provided with a projection or knurl to limit the advance of the cap or cover, to be shown hereinafter.

The portion E is likewise cut away more or less upon one side, (shown at F, Fig. 1,) so as to uncover the elastic rubber tube or receptacle within, and allow access to and pressure upon the same. This slot or cut-away part may extend from just beneath the knurl to within a half-inch or so of the end of the tube, the remaining distance serving as a socket for the shank of the pen-holding part B^4; and the slot should be of such form, preferably oval, as will most readily allow the thumb or finger to rest against the elastic tube D within without exerting undue pressure thereupon.

B shows the form and construction of the pen-holding portion proper. As seen in the sectional view, Fig. 3, a bent tube, B^2, projects from the front and opens beneath the body of the pen A, though it may be made to extend along above, instead of beneath, the same, if so desired. This tube passes directly through the part B, and may be made of white metal or other not easily oxidizable substance, or of vulcanite or horn. A more fragile material should not be employed, lest in removing and inserting pens, or by an accidental fall, the delivery-tube should become broken and the whole device rendered useless. What I prefer and use, however, is an alloy of lead and tin, known as "white metal." This substance will not clog up with the most acid inks, is easily bent into shape, and can be made cheaply and without special machinery. This quality of not oxidizing from use renders it specially valuable, as the greatest difficulty with fountain-pens heretofore has been the liability of the ink-tube to clog if made of metal, or to break, as above stated, if of glass or similar material. If so preferred, the whole of B may be cast or formed in a single piece instead of with a removable tube.

At B^5 is seen the slot for the reception of the stub end of the pen, which extends far enough back to give a secure seat for the same, but not connected with or opening into the tube B^2.

B^3 shows a knurl formed around the part B to limit the entrance of the shaft B^2 into the tube or handle E E′. B^1 shows the hollow terminal screw connected with the tube B^2, which, with the ferrule C, forms the means of attaching hermetically the elastic rubber tube D to the solid part B.

The ferrule or collar C, Fig. 4, is a simple ring of thin metal, which, having an inside diameter slightly smaller than the outer diameter of the elastic tube D, admits the open end of the same with some difficulty, so as to exert compression upon it and slightly diminish the diameter of the bore. It thus forms a solid resisting outer surface, and the rubber tube may then be screwed on with great facility, the screw cutting or indenting its way into the rubber, which then clings to it with great tenacity, the outer surface of the ferrule C also forming an extension of the shank B^4, and assisting in the support of the same in the tube E.

The loosely-fitting removable elastic rubber receptacle for the ink is shown in Fig. 5, and also in Fig. 1. It acts as a suction-bulb, and is made sufficiently rigid and elastic to return to its normal state of distention with considerable force when released from compression. It is tubular in form, with substantially-par-

allel sides, and is permanently and hermetically closed at one end, D^2. This may be done during the process of vulcanization of the rubber, or by ferrule and plug, something in the manner of the joint formed at the opposite end, and just described. It may also be formed like the bulbs of syringes, &c., in a mold; but I employ and prefer the following method of manufacture: The soft unvulcanized rubber, in sheets or otherwise prepared, is wrapped around a short metal pin of suitable size and length, and held in place by means of a strip of muslin, somewhat as in the manufacture of ordinary light rubber tubing, the plug D^2, also unvulcanized, being placed in position as the short tubes are formed up. The whole rolled up together is then vulcanized. The pin and covering are afterward removed and the ends trimmed off, as may be requisite. In this manner the closed tubes are made both rapidly and economically, no molds or other mechanism being required, while at the same time a better result is attained at a far lower cost.

I do not herein claim this mode of manufacture or its products for the reason that I propose to make them the subject of another application.

Fig. 2 exhibits the cap or cover, which is intended to slip over the pen and handle, so as to protect the same and allow the device to be carried in the pocket without injury or loss of ink. It is also provided with a central knurl, G′, partly for the sake of symmetry and partly to afford a seat for the air-hole J, so that, in slipping on the cap H H′ when the air is compressed therein, instead of forcing out the ink by pressure or withdrawing it by suction when the cap is removed, an equilibrium may be maintained by means of the same.

When in position the hole J lies opposite to and against the body of the part B, so as to prevent the entrance of foreign bodies, dust, &c., and to prevent leakage of ink in case of accident to the parts inside. This cap, also, is cylindrical, and of a size to fit snugly over the tube or handle E E′, so that when not used as a cap, it may be placed upon the opposite end to lengthen the handle of the pen-holder, its advance being arrested, when applied from either end, by the central knurl G. It will also be observed that the cap covers completely the slotted or cut-out portion F of the tube E E′, whereby all the parts are protected from injury or pressure while in the pocket, while at the same time a much handsomer and more symmetrical article is produced.

The method of using this pen is as follows: Supposing it to be filled with ink, it is taken in the hand like an ordinary pen-holder, the thumb, or, if preferred, the tip of one of the fingers, resting upon the inner elastic tube D, through the cut-away portion F of the outer case E E′. In this manner the rubber tube will be compressed somewhat, either by the ball of the thumb when the opening is turned to the left, the tip of the first finger when turned to the right, or the side of the middle finger when turned underneath. In any of these positions the feeding of the ink is accomplished with perfect steadiness and safety, no tendency to drop ink being perceptible, while the supply can be regulated almost without the consciousness of the writer. Should the ink be gummy, or the nozzle of the delivery-tube B^2 become choked up, a sharp shake or pressure upon the side will remedy it.

In case it is necessary to remove the rubber tube for cleaning, &c., it may be readily unscrewed and replaced when desired.

To renew the supply of ink when the tube has become emptied, the part B is taken hold of and the tube D withdrawn from its case, in which it fits loosely. The elastic tube D is then grasped beneath the thumb and first two fingers of each hand, one beneath the other, the pen A inserted in a bottle of ink to a sufficient depth to cover the nozzle of the tube B^2. The elastic tube is compressed, and immediately fills itself by suction. The parts are then replaced, and the pen is again ready for use.

On account of the elasticity and resistance of the rubber ink-tube it will be found almost impossible to throw ink upon the paper without repeated trials, rendering it safe for even the most inexperienced to use. No valves or other loose parts are employed, and all the operations are expeditious and cleanly. The feeding down of the ink by pressure upon the periphery of a stiff elastic cylinder is much more steady than when pressure is exerted upon a distended drum or membrane, in the one case the pressure increasing proportionately to the successive portions compressed, the other receiving a sudden maximum pressure from the first, which tends to cause the ink to spurt, and renders the pen less safe and far more difficult to handle, while, moreover, a tightly-stretched membrane is liable to rupture and speedy disintegration from use.

Instead of the slot F in the case E for giving access to the tubular cylinder within, a stud and button, or its equivalent, may be employed to pass through a small perforation in the side of the tube, and rest upon and act against the elastic tube within, though I prefer the form and method herein exhibited as being quite as effective and somewhat less complicated both in construction and in use.

I have filed, February 26, 1878, an application for a design based upon the configuration of case E and cover H, and I desire to disclaim any part of the subject-matter of said design application shown in this application.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The hollow handle divided by the raised knurl G into two portions, E and E′, one plain and the other slotted, together with the detachable metallic pen-sheath B and its reservoir, in combination with the light metal cap

or cover H H′, arranged to close from either end against the said knurl or stop G, substantially as and for the purpose described.

2. The combination of the pen-sheath B, the internal elastic reservoir D, and the hollow cylindrical handle E E′, provided with the knurl G and open thumb-slot F, together with the cap or cover H H′, having an air-vent, J, substantially as and for the purpose described.

3. In a fountain-pen, the combination of the pen with the ink-discharge tube B^2, composed of soft metal, whereby the latter may be bent or adjusted to various-sized pens, to regulate the flow of ink, substantially as described.

4. In a fountain-pen, the sheath portion B, having a feed-tube, B^3, and pen-sheath B^5, the whole formed or molded in a single piece, substantially as described.

5. A pocket-case for fountain-pen holders, consisting of the twin parts E and H, the former provided with the stop G and open thumb-slot F and the latter with the air-vent J, substantially as herein described.

6. The pocket fountain-pen consisting of the pen-sheath portion B, provided with the neck B^1, the reservoir D, ferruled at its open end, the case E, provided with thumb-slot F, and cover H, substantially as described.

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