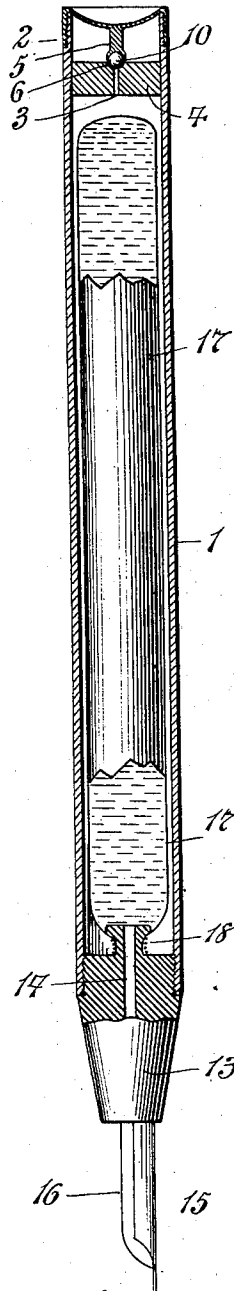


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FOUNTAIN PEN.

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To all whom it may concern:

Be it known that I, EDWARD H. JOHNSON, a citizen of the United States, residing at New York, borough of Manhattan, county 5 and State of New York, have made a new and useful Invention in Fountain-Pens, of which the following is a specification.

My invention has for its objects, first, to devise a simple, cheap and efficient means 10 for enabling a person to fill the ink chamber or barrel of such pens by creating a vacuum therein due to suction effected through the mouth. Second, to devise a fountain pen of the vacuum type which, 15 after it is once filled, may be so regulated that the feed of the ink to the pen may be made practically constant by simply admitting air into an exhaust chamber, thereby modifying the application of the 20 vacuum from time to time without wasting any of the ink and assuring an absolute and positive feed at all times. Third, to devise a fountain pen having a collapsible ink chamber which is of such structural 25 nature that when the ink is exhausted it is inert or inherently incapable of restoring itself to its normal or distended condition, as when filled with ink and ready for use.

My invention will be understood by referring to the accompanying drawing which 30 illustrates the same in sectional view with the ink containing tube or sack partly in elevational and partly in broken sectional view, and all upon an enlarged scale, preferably 35 2 to 1, said ink containing tube being entirely filled with ink.

The invention illustrated and hereinafter described is of that type of fountain pen in which a secondary or supplementary ink 40 chamber or barrel, such as a soft rubber tube or sack, is employed for the purpose of effecting the automatic filling of the pen. These ink holding sacks as heretofore devised have invariably been of normal tubular 45 form, also quite elastic, and the method of utilizing them has been to exert an external pressure thereon in various ways and so distort them as to cause their automatic return to normal form upon release of the 50 pressure or applied energy, thereby supplying the essential difference of air pressure to insure the inflow of the ink. Manifestly, the work done in such devices results from the elasticity of the material of which the 55 tube or sack is composed. This being the

case, it is obvious that the heavier the body of the sack—assuming the external pressure to be unlimited—the greater will be the intake capacity of the tube. If, however, the external pressure or applied energy be limited, as is the case when it is supplied by 60 inflating the human lungs and through the agency of the mouth, then the intake capacity is limited to the weight of body such pressure is capable of compressing, which in 65 point of fact is very small, so small indeed as to prevent the utilizing of this simple source of pressure supply.

My improvement reverses all this, both in principle and in the quality of the means 70 employed. I withdraw instead of applying external pressure and I employ a tube or sack which is as completely inert and incapable of self-action due to elasticity as 75 it is possible to secure. My tube or sack being inert or incapable of sustaining even its own weight, naturally collapses as it is emptied of ink; hence I have but to withdraw the air surrounding it in the ink 80 chamber to insure the immediate and full flow of ink into it. In view of the inert or collapsible nature of this tube or sack any air which enters the same, as the ink is 85 drawn out in use, will naturally be forced out as air is admitted into the ink chamber. Obviously, this action is impossible with a 85 sack whose normal form is tubular and which is fully extended by its inherent elasticity when empty, as is the case with self filling pens of this type heretofore devised. 90

Referring now to the drawing in detail, 1 represents the exhaust chamber or body of the pen proper, the same being provided with a relatively loosely screw-threaded 95 cap 2.

3 is a regulating suction vent or opening in an air tight plug 4 secured in the upper end of the exhaust chamber.

5 is a downward neck or extension inside the cap 2 provided at its lower end with a 100 hemispherical socket.

6 is a similar hemispherical socket or seat in the upper surface of the plug 4 adapted to seat a ball valve 10 between the hemispherical sockets and the upper end of the 105 vent 3; these parts together constituting means for regulating the flow of the ink at the will of the user, and also for effectually shutting off such flow when it is desired to discontinue the use of the pen. The parts 110

referred to also constitute means for effecting the filling of the ink chamber by suction, when desired.

13 is a point section, 14 the ink duct and 5 15 the nib or pen; 16 being the feed-bar. The inner end of the point section 13 is provided with a knob or extension 18 to which is secured by a thread or otherwise my novel ink holding tube or sack 17, the 10 same being open at its lower end and preferably made of thin collapsible material; in fact so thin that when the ink is fully exhausted and air has been admitted from time to time into the exhaust chamber it 15 will collapse by its own weight. This tube may be made of bladder, rubber, oil-skin, or any equivalent impervious material and it should be of the finest quality and of the thinnest possible nature. It is to be distinctly understood that the relation between 20 the screw-threads of the cap and exhaust chamber 1 is such that air will freely circulate between such threads when the cap is turned backward a sufficient distance to unseal its connected relation with the seating 25 shoulder for such cap at the upper end of the chamber.

In the use of this novel pen it is only necessary to slightly loosen the relatively 30 loosely screw-threaded cap 2 enough to release the ball valve 10, insert the nib or pen 15 and feed-bar 16 into an ink bottle and then draw by suction all of the air out of the chamber 1. In doing this a 35 vacuum is created in the chamber 1, thus causing the ink to flow upward into the ink holding tube or sack 17, ultimately distending the same to its fullest extent and when filled it will prevent the further flow 40 of ink therein, and in its distended position will practically fill the entire chamber 1, as shown in the drawing. It will be apparent that under no circumstances can any ink reach the mouth of the user, either during 45 the process of filling or after the tube or sack 17 is full. The valve or ball 10 automatically reseats itself whenever the suction is discontinued, thereby maintaining the vacuum at all times. The vacuum effects 50 may be modified or regulated from time to time by releasing the screw cap 2, and unseating the valve or ball 10 by suction, or by reversing or turning the chamber or barrel upside down, as when this is done the 55 vacuum is broken down. If the chamber 1 be of transparent material, the user will observe the relative collapsed condition of the tube 17 and be thereby advised as to when the pen should be refilled.

60 For obtaining the best possible results with the invention, it is important that when the tube or sack 17 has been filled to its fullest capacity with ink there shall be no elastic strain on any part thereof, for the 65 reason that any such strain will offer an un-

necessary pressure upon the ink contained therein, thus forcing it out through the ink duct 14, instead of allowing the same to flow by capillary action as is usual with such pens.

I do not limit my invention to the special 70 details of construction shown in the drawing and hereinbefore described, as obviously a number of the features thereof might be departed from and still come within the 75 scope of my claims hereinafter made, my invention being directed broadly to an improved fountain pen in which the ink is held in suspension in a collapsible tube or sack inclosed in an exhaust chamber, through the 80 agency of a vacuum established by suction of the air through a suction vent preferably at or near the top of the chamber, the structural arrangement being such that the ink can never reach the mouth of the user during 85 the process of filling and also such that the flow thereof, when in use, may be regulated at will by relieving the vacuum through the agency of means at or near the upper end of the device. 90

I am aware that fountain pens have heretofore been constructed with transparent ink containing chambers for the purpose of indicating the height of the ink therein, and I make no claim hereinafter broad enough 95 to include such an article.

Having thus described my invention what I claim and desire to secure by Letters Patent of the United States is—

1. A fountain pen provided with a barrel 100 and an inert collapsible ink tube or sack located therein, said tube being connected at its lower end to the nib or pen; together with a suction vent connecting the interior of the barrel with the exterior air, and 105 means for closing the vent when the tube is filled to the desired extent, substantially as described.

2. A fountain pen having a barrel, an inert collapsible tube or sack located there- 110 in and connected at the lower end to the nib or pen proper; together with a vent at the upper end of the barrel and adjustable means for regulating the flow of air in accordance with the value of the vacuum and 115 the varying quantity of ink in the pen, substantially as described.

3. A fountain pen embracing a barrel, an inert collapsible ink tube open at its lower end only and connected directly with the 120 feed duct of the nib or pen; together with a vent at the other end of the barrel, and means for regulating the flow of air through the vent when it is desired to modify the vacuum and regulate the ink feed to the 125 pen, substantially as described.

4. A fountain pen provided with an inert collapsible ink tube or sack connected at one end to the feed duct of the nib or pen; together with a suction vent for inflating and 130

filling said tube with ink by suction, substantially as described.

5 5. A fountain pen embracing an inert collapsible ink tube; a nib or pen connected thereto by a feed duct; together with a vent for filling it by suction, and a valve for maintaining it filled under the influence of a vacuum when established, substantially as described.

10 6. A fountain pen provided with a transparent exhaust chamber having a suction vent at one end and an ink duct at the other,

the latter being operatively connected with an inert collapsible tube or sack located wholly within the chamber, and a valve for 15 closing the vent when the pen is charged or filled with ink, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

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Witnesses:

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