

R. D. MADDOX.
 PIPETTE.
 APPLICATION FILED DEC. 9, 1912.

1,098,514.

Patented June 2, 1914.

FIG. 1

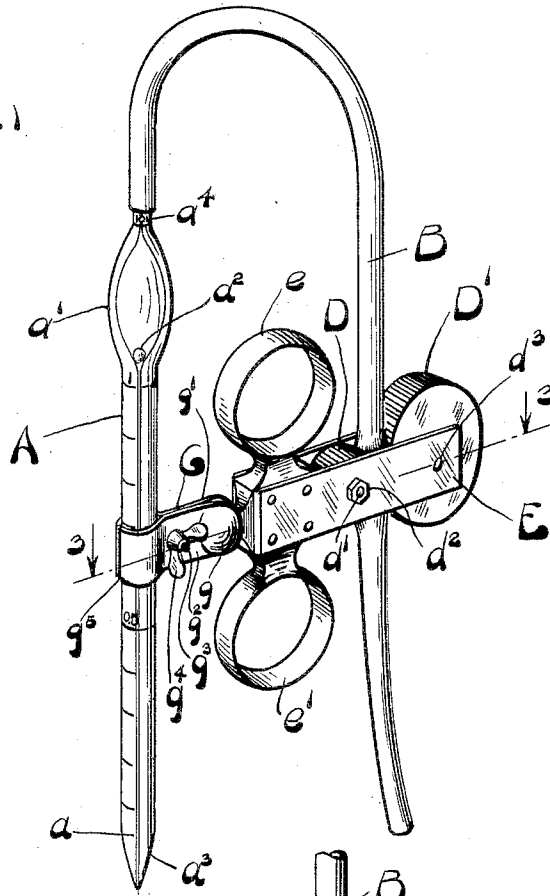


FIG. 2

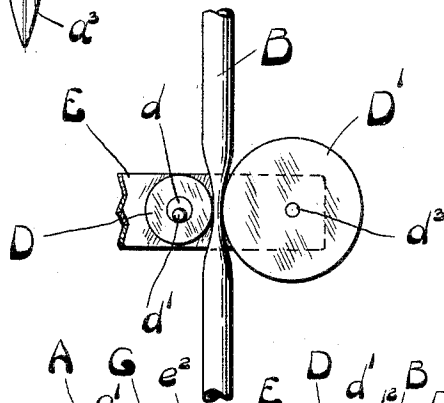
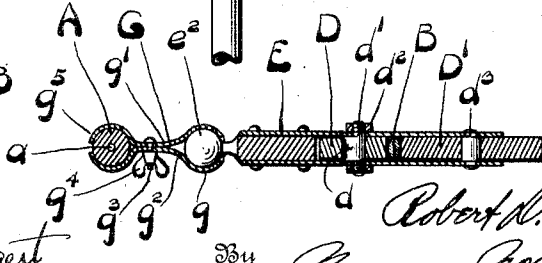


FIG. 3



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PIPETTE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ROBERT D. MADDOX, a citizen of the United States of America, and resident of Cincinnati, county of Hamilton, and State of Ohio, have invented certain new and useful Improvements in Pipettes, of which the following is a specification.

My invention relates to pipettes for taking up, by suction, fluids in definite amounts, which are minutely accurate. It relates particularly to pipettes for use in making tests of blood, to determine the amount of corpuscles in a definite amount of the blood, and the relative proportion therein of the different kinds of corpuscles, such as red and white ones, to each other.

The object of my invention is a pipette, in which the suction may be accurately controlled by the hand of the operator. This object is attained by the means described in the specification, and illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a pipette embodying my invention. Fig. 2 is a detail view of the rollers, the frame, and the rubber tube embodying my invention. Fig. 3 is a sectional view taken upon line 3—3 of Fig. 1.

The pipette embodying my invention comprises a glass tube A, into which the liquid is to be drawn by suction, a rubber tube B, the compression of which controls the pressure of air within the glass tube, rolls D D', adapted to exert a pressure along the rubber tube, and a frame E, in which the glass tube and the rollers are mounted.

The glass tube A is of the form usually used in making blood tests, that is, it has a central minute bore a , extending longitudinally through it, a bulb a' , within which is a loose glass spheroid a^2 , a pointed fluid-receiving end a^3 , and a reduced upper end a^4 , over which the rubber tube B is fitted snugly.

The frame E consists of longitudinal parallel plates, between which is held a finger piece, which has circular rings e e' , adapted to receive the fingers of the operator, for supporting the device. Rolls D D' are mounted between the longitudinal plates of the frame. The spindle d of roll D has eccentric ends d' , which extend through the plates and receive lock-nuts d^2 . By means of these eccentrics, the distance of spindle d from spindle d^3 of roll D', may be

regulated, according to the size of the tube B. The periphery of roll D' is knurled.

The frame E has upon its front end a ball e^2 , which is engaged by the socket g of a clamp G, which is formed from spring plates g' g^2 , which are held together in their centers by means of a bolt g^3 and a wing nut g^4 , and at one end are curved to form a split collar g^5 , which fits about the tube A, and at the other end are swaged outward to form the socket g .

In operation: To adjust clamp G relatively to the frame E, at an angle which the operator finds most convenient, the wing nut g^4 is loosened, the clamp turned upon the ball g to said angle, and then held in that position by tightening the wing nut. The operator places the index finger through the ring e , his middle finger through the ring e' , which brings his thumb adjacent to the roller D'. The point a^3 of the tube A is then inserted in the fluid, which is to be drawn into the bore a of the tube A. To create suction in the tube, the operator rotates the roller D' in a clockwise direction, by means of his thumb. This feeds the tube B upward, thereby increasing the length of the rubber tube between the glass tube A and the rollers D D' and rarefying the air in the pipette, which causes the liquid to be drawn into the receiving end thereof. By imparting a very slight rotation to the roller D', a correspondingly slight movement may be imparted to the rubber tube B, and hence a minute change in the pressure of the air in the pipette may be effected. Since it requires little experience and little skill to regulate the rotation of the roller D', minute changes in the pressure of the air in the pipette can be effected, without the exercise of undue skill. Therefore, one may easily draw into the pipette, fluid in exact amounts. After the desired amount of fluid has been drawn into the tube A, said amount may be drawn up into the bulb a' , by removing the receiving end a^3 from the fluid and then rotating the roller D' in a clockwise motion. When one desires to eject the fluid from the pipette, he rotates the roller D' in a contra-clockwise direction.

What I claim is:

1. In a pipette, the combination of a frame, compression rollers and a fluid-receiving tube mounted on the frame, and a rubber tube connected to the fluid-receiving tube

and passing between the compression rollers whereby the rotation of the rollers compresses the tube at progressive points along its length and varies its length between the fluid-receiving tube and the rollers.

2. A pipette, comprising a frame, means on the frame for holding a fluid-receiving tube, finger pieces upon the frame, and compression rollers mounted in the frame adjacent to the finger piece, a fluid-receiving tube mounted in the frame, and a rubber tube secured to the aforesaid tube and passing between the compression rollers.

3. A support adapted for use in pipettes and comprising a frame, rollers mounted upon the frame and adapted by their rotation to compress a tube between them, and means for holding the fluid-receiving tube upon the frame.

4. In combination with the fluid-receiving tube of a pipette, a frame, an adjustable clamp mounted on the frame and adapted to engage the tube, a pair of compression rollers rotatably mounted on the frame, and a collapsible tube secured to one end of the fluid-receiving tube and passing between the compression rollers.

5. A pipette comprising a fluid-receiving tube, a frame, a clamp, adapted to engage the tube, adjustably mounted on one end of the frame, a pair of cooperating compression rollers rotatably mounted on the frame, so that the peripheral face of one roller projects to an accessible position beyond the end of the frame opposite to the clamp, and a collapsible tube secured to the fluid-

receiving tube and passing between the rollers.

6. A pipette comprising a fluid-receiving tube, a frame extending substantially at right angles to the tube, an adjustable clamp, for engaging the tube, adjustably mounted on the frame, a pair of cooperating compression rollers rotatably mounted on the frame, with the peripheral edge of one roller projecting to an accessible position beyond the frame, a finger grip mounted on the frame between the rollers and the clamp, and a collapsible tube secured to one end of the fluid-receiving tube and passing between the compression rollers, whereby the rotation of the rollers compresses the tube at progressive points along its length and varies its length between the fluid-receiving tube and the rollers.

7. A pipette, comprising a fluid-receiving tube, a frame, means for securing the tube to the frame, a collapsible tube secured to one end of the fluid-receiving tube, a pair of compression rollers rotatably mounted on the frame and between which the collapsible tube extends, and means for adjusting the positions of the rollers relatively to each other.

In testimony whereof, I have hereunto subscribed my name this 6th day of December, 1912.

ROBERT D. MADDOX.

Witnesses:

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W. THORNTON BOGERT.