

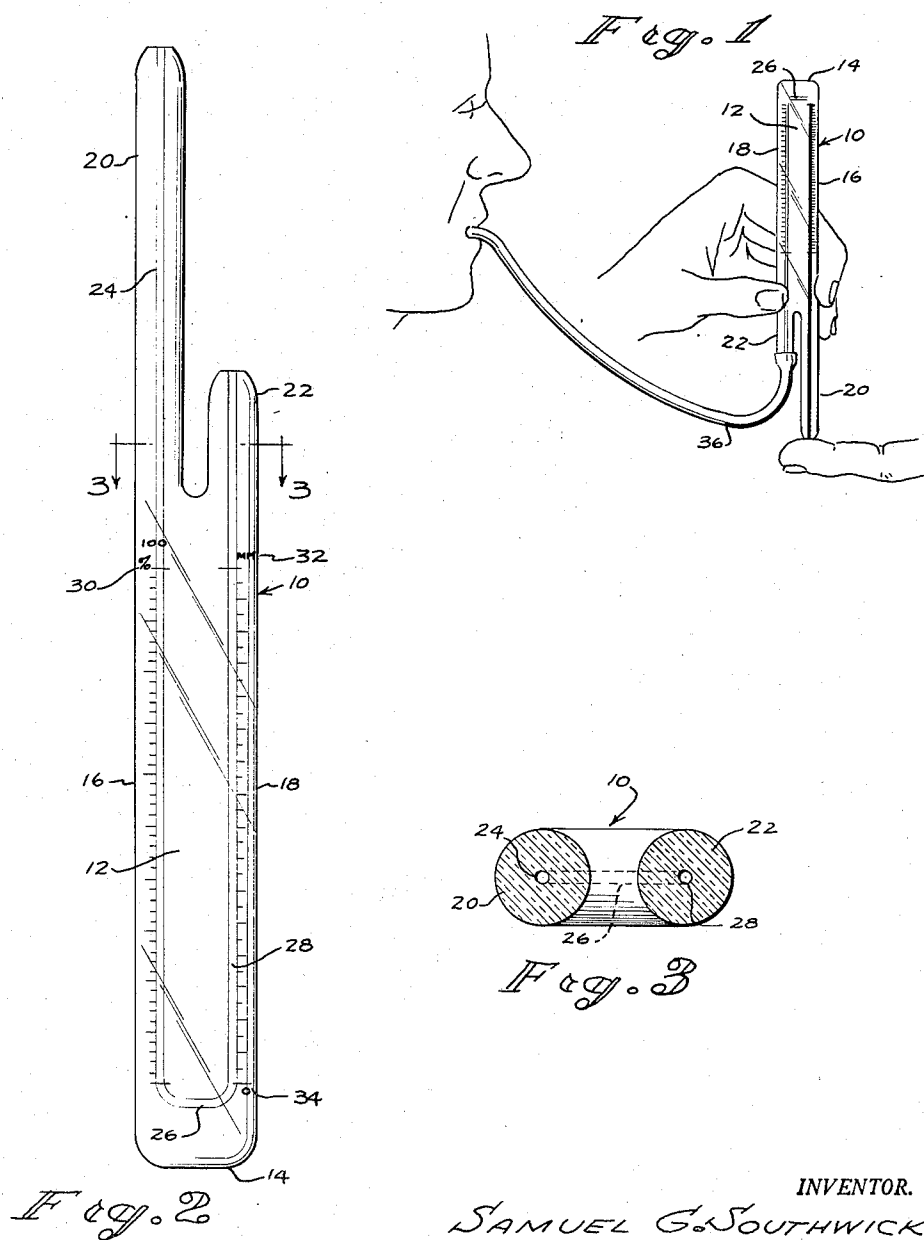
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MULTIPLE PURPOSE HEMATOCRIT PIPETTE

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MULTIPLE PURPOSE HEMATOCRIT PIPETTE

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2 Claims. (Cl. 73—425.4)

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This invention relates to pipettes, and more particularly, has reference to a pipette of the hematocrit type, used for drawing an exact quantity of capillary blood for hematologic study.

Pipettes are used in laboratory analysis of blood, to determine the hematocrit of the blood, and to determine, in addition, the erythrocyte count, erythrocyte fragility, leucocyte count, hemoglobin concentration, blood sodium concentration, blood potassium concentration, and blood glucose determination.

The pipette which I have conceived is so designed as to permit the blood sample to be centrifuged while it is in the pipette, to determine its hematocrit before the blood is expelled and other determinations are carried out upon it. In this way, the hematocrit and the other determinations mentioned above can be carried out, as mentioned, upon the same sample of capillary blood, and time can thus be saved in performing these determinations. In addition, the pipette which I have conceived is so designed as to obviate the necessity of a venepuncture, a venepuncture being required by most of the methods of hematocrit determination presently being followed.

Summarized briefly, the pipette invention comprises a solid, one-piece, transparent body of molded glass or equivalent material, having at one end a pair of side by side longitudinal extensions of different lengths. A continuous bore is formed in the body, said bore being of a U shape, with the bight of the bore being disposed adjacent that end of the body remote from said extensions, said bight merging into elongated, parallel end portions extending longitudinally of the body within the extensions, and opening at the free ends of the extensions. The U-shaped bore formation, it may be noted, is so designed as to prevent the blood sample contained there-within from being expelled during centrifugation of the pipette. Graduated scales are provided upon the body, extending longitudinally of the respective end portions, said scales being used during the making of a desired determination.

Other objects will appear from the following description, and claims appended thereto, and from the annexed drawing, in which like reference characters designate like parts throughout the several views, and wherein:

Figure 1 is an elevational view of a pipette formed in accordance with the present invention, as it appears when in use;

Figure 2 is an enlarged side elevational view of the pipette per se; and

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Figure 3 is a cross sectional view, the scale being still further enlarged, taken substantially on line 3—3 of Figure 2.

The pipette constituting the present invention has been designated generally by the reference numeral 10, and is formed as a solid, molded body 12 of glass or other transparent material of non-corrosive characteristics selected for its adaptability for sterilization and cleaning.

The body 12 is relatively elongated, and is of approximately rectangular or oblong cross sectional configuration. One end surface 14 of the body is flat, as best shown in Figure 2, for a purpose to be made presently apparent. Said flat end surface 14 is rounded off at its corners, and merges into elongated, straight side surfaces 16, 18 respectively, said side surfaces being transversely rounded in the preferred embodiment of the invention.

That end of the body 12 remote from the flat surface 14 is integrally formed with straight, parallel, longitudinal extensions or tips 20, 22. The tips, as will be noted from the drawing, are of different lengths, the tip or extension 20 being approximately three times as long as the tip or extension 22. The free ends of the extensions are rounded off, as best shown in Figure 2.

Formed in the body 12 is a continuous bore which, as shown in Figure 3, is preferably very small in diameter as compared to the diameter of either tip of the body. The bore is of a U shape, having an elongated end portion 24 of straight formation from end to end, said end portion being disposed in closely spaced, parallel relation to the side surface 16 of the body 12, and extending continuously from the free end of the longitudinal extension 20 to a location adjacent the end surface 14. There the end portion 24 merges into a short bight portion 26 of the bore, extending transversely of the body 12 in relatively closely spaced, parallel relation to said end surface 14.

The bight portion 26 merges, in turn, into a straight end portion 28 of the bore, that is disposed in closely spaced parallelism with the side surface 18 of the body. The end portion 28 of the bore extends within the short longitudinal extension 22, opening upon the free end of said short extension.

I provide, upon the body 12, a scale 30, said scale being calibrated in percent markings, from 0% to 100%. A second scale 32 is also provided, calibrated in millimeters or other suitable units. The scales 30, 32 overlie the end portions 24, 28 of the bore, each scale terminating close to the bight portion 26 at one end, and terminating at

its other end in spaced relation to the longitudinal extensions 20, 22.

In use of a pipette formed in accordance with the present invention, the pipette would first be rinsed with a solution of heparin or some other suitable anti-coagulant. A hollow, rubber aspirator of the type used with hematologic pipettes is then attached over the short longitudinal extension or tip 22, said aspirator being designated by the reference numeral 36 and being shown connected to the extension 22, in Figure 1.

Blood from a skin puncture (or, if desired, from a venepuncture) is then aspirated through the elongated end portion 24 of the bore, to the zero end of the percent scale 30, that is, that end of the scale disposed adjacent the bight portion 26.

The longitudinal extension 20 of the pipette is then removed from the blood being aspirated and the blood column is sucked around the curve or bight portion of the bore until the ends of the blood column in the bore coincide with those marks of the scales 30, 32 nearest the tip of the pipette, that is, nearest that end of the pipette provided with the longitudinal extensions 20, 22.

To determine the hematocrit of the collected blood, the aspirator is now removed, and the pipette is centrifuged, with the longitudinal extensions 20, 22 of the pipette directed toward the axis of the centrifuge, until the maximum packing of the erythrocytes is achieved. The hematocrit reading is then taken from the percent scale, at the level of the plasmaerythrocyte interface, that is, the top of the packed erythrocyte column.

The sedimentation rate of the blood sample may be measured before the hematocrit determination is made, by standing the pipette on its flat end surface 14, with the longitudinal extensions 20, 22 extended upwardly as in Figure 2. After a predetermined period of time (1 hour being usual) the amount of sedimentation is read from the scale 32. Should it be desired to determine the sedimentation rate more rapidly, the pipette with its sample may be centrifuged for a predetermined length of time equivalent to allowing the pipette to remain stationary for an hour. Thereafter, the sedimentation rate, that is, the amount of sedimentation in millimeters or in other suitable units after the given time interval, is read from the scale 32 in a similar manner.

The icteric index of the blood sample may be determined after centrifugation by matching the color of the plasma layer in the pipette with the color of aqueous solutions of potassium dichromate, or with other suitable standards. It may be noted that the plasma need not be removed from the pipette in making this determination.

After the performance of none, any, or all of the above tests the contents of the pipette can be expelled and further determinations carried out on the blood sample.

The exact dimensions and proportions of the pipette can, of course, be varied, although it is preferred that the general proportions be substantially as shown in the drawing. It may be noted that a filling mark can be placed upon one

of the scales, as shown at 34, said filling mark being preferably located at the lower end of the scale 32. The filling mark, can however, be located at the lower end of the scale 30 if desired. When the filling mark 34 is disposed at the lower end of the scale 32, the distance between the free end of the longitudinal extension 20 and the one-hundred percent marking of the scale 30 must be equal to the length of the calibrated portion of the end portion 24 of the bore.

It is also worthy of note that the free end of the longitudinal extension or tip 20 may be shaped to fit a standard hypodermic needle, so as to permit the pipette to be filled by means of a venepuncture if desired.

It is believed apparent that the invention is not necessarily confined to the specific use or uses thereof described above, since it may be utilized for any purpose to which it may be suited. Nor is the invention to be necessarily limited to the specific construction illustrated and described, since such construction is only intended to be illustrative of the principles of operation and the means presently devised to carry out said principles, it being considered that the invention comprehends any minor change in construction that may be permitted within the scope of the appended claims.

What is claimed is:

1. In a pipette, a solid, transparent body formed with side by side longitudinal extensions of different lengths at one of its ends, said body having a continuous bore substantially U-shaped with parallel end portions extending within and opening at the free ends of said extensions, the body having scale markings disposed longitudinally of the respective end portions.

2. In a pipette, a solid, transparent body formed with side by side longitudinal extensions of different lengths at one of its ends, said body having a continuous bore substantially U-shaped with a bight portion adjacent the other end of the body and with parallel end portions extending from the bight portion within said extensions and opening at the free ends of the extensions, the body having scale markings disposed longitudinally of the respective end portions and terminating adjacent the bight and said extensions respectively.

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References Cited in the file of this patent

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FOREIGN PATENTS

Number	Country	Date
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