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HAEMACYTOMETER

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This invention relates to improvements in haemacytometers, and a principal object of the invention is to provide a haemacytometer having novel means for rendering the operation of filling the chambers less critical, and whereby the charging operations of the chamber may be substantially uniform.

In the prior forms of haemacytometer, considerable difficulty has been experienced in accurately charging the chambers with the solution. In general, the tendency is to overcharge, or, in other words, to supply the space between the cover glass and the counting table with solution in excess of that required to completely fill the chamber. Such overcharging may result in overflow of the solution into the channels adjacent the counting chambers, which spoils the test and necessitates recharging, it having been found that tests conducted under overflow conditions are unreliable. Another possible result of overcharging is a displacement of the cover-glass from its normal position, since if surface tension of the liquid resists the tendency to overflow into the adjoining channels, the surplus liquid will tend to elevate the cover glass. This condition results in a too large count.

Frequently also attempts to avoid overcharging results in an undercharge. Where too small a quantity is deposited at the chamber entrance, the chamber will not be completely filled, or, at best, the charge will go in spasmodically, causing bubbles and uneven distribution because of the settling of the corpuscles during the slow movement of the liquid into the chamber.

We have discovered means whereby the charging operation may be made substantially independent of the amount of liquid deposited on the haemacytometer, whereby assurance may be had that the chamber will be completely and uniformly filled for all counting operations.

In the attached drawing, in which we have illustrated our invention:

Figure 1 is a view in perspective of a haemacytometer made in accordance with our invention;

Fig. 2 is a transverse section on the line 2—2, Fig. 1, and

Fig. 3 is a fragmentary sectional view similar to that of Fig. 2 illustrating a modification within the scope of the invention.

With reference to the drawing, we have therein illustrated a haemacytometer conforming in all essential respects to the present generally accepted standard. The counting chambers designated by the reference numeral 1 are formed

on tables extending transversely of the body of the haemacytometer, and are segregated from each other and from the adjacent cover-glass supporting tables 2, 2 by moats 3, 3 and 4. As illustrated, the cover-glass supporting tables 2 are adjoined on one side by the moats or channels 3, and on the opposite side by channels 5. The upper surfaces of the counting chambers 1, 1 lie slightly below the upper surfaces of the tables 2, 2 so that when a flat cover glass is placed upon the latter tables, a narrow space 6 is formed between the under surface of the glass and the upper surfaces of the table 1 to form the counting chamber. The cover glass is designated by the reference numeral 7 in Fig. 2, and is indicated in dotted lines in Fig. 1.

In accordance with the present invention and in a preferred embodiment we bevel the end portions of the counting chamber tables, as indicated at 8, to form an inclined surface extending downwardly from one side of the counting chamber 6. These bevel surfaces are so relatively arranged with respect to the cover glass 7 that the edges of the latter project over the inner portions of the bevels, as shown in Fig. 2.

In utilizing a haemacytometer in accordance with our invention, the blood solution is deposited upon these inclined surfaces and at the edges of the cover plate so as to contact the under surface of the cover glass as well as the said inclined surface whereby capillary action may tend to draw the solution into the counting chamber. With a haemacytometer constructed as described, it is immaterial whether the amount of liquid introduced onto the surfaces 8 is greater than that required to completely fill the chamber 6, since while the liquid is rapidly drawn by capillary action into the chambers, the action stops immediately when the chambers are full, there being no tendency to overcharge. The relatively large spaces formed between the outer ends of the cover glass and inclined surfaces 8 act as reservoirs which feed the counting chambers to the extent of their normal capacity, but which have no tendency to cause an overcharge of the chambers. Thus while the liquid is drawn with great rapidity into the chamber, the feeding action stops immediately after the chamber is completely filled. Since there is no danger of overcharging the counting chambers there need be no hesitation in depositing an ample quantity of the liquid upon the haemacytometer, and under charging with its attendant disadvantages may accordingly be readily avoided.

Our invention constitutes a substantial im-

provement in haemocytometers, in that it insures substantially uniformly good results and results that may be obtained by relatively inexperienced technicians. Heretofore the instruments could not be depended upon to give uniformly accurate readings except in the hands of experienced technicians, this being due largely to the difficulty in accurately charging the chambers. Since our invention has eliminated the critical nature of the charging operation, it is apparent that the utility of the instrument has been greatly improved.

It will be apparent that the device is capable of modification from the form shown in Figs. 1 and 2 without departure from the invention, and in Fig. 3, we have illustrated a possible embodiment which while not as desirable as the embodiment illustrated in Figs. 1 and 2 will yet materially improve the charging characteristics of the haemocytometer and the tests made therewith. In this instance, the counting chamber tables have at their outer ends a relatively low portion 9 which, as illustrated, is in part overlaid by the cover glass 7, the space of greater depth between the surface 9 and the under surface of the cover glass adjoining the counting chamber 6 forming in effect a reservoir for the latter which feeds the counting chamber with sufficient liquid to completely fill it without the same tendency to overcharge that was found in the prior forms of haemocytometer.

There may be still other modifications without departure from the essential features of the invention as defined in the appended claims.

We claim:

1. A haemocytometer comprising a table, and

means for supporting a cover glass above and in proximity to said table to form the counting chamber, a portion of said table over which an edge portion of the cover glass normally extends being recessed to form a reservoir chamber adjoining the counting chamber adapted to receive a liquid and to feed said liquid by capillary action to the counting chamber.

2. In a haemocytometer, the combination with relatively movable elements, and means for relatively positioning said elements to form a capillary space between opposed surfaces thereof constituting the counting chamber, the opposed surfaces of said elements diverging in part from a side of said chamber to form a reservoir chamber of greater depth than the counting chamber adjoining the latter, said reservoir chamber being adapted to receive a liquid and to feed said liquid by capillary action to the counting chamber.

3. A haemocytometer comprising a segregated counting-table surface terminating at one end in a downwardly extending incline, and means for supporting a cover glass in closely spaced relation to and above said surface with a free edge portion thereof in overlapped relation with said incline, the overlapped surfaces of said incline and cover defining a chamber the capacity of which is as great at least as that of the chamber formed between the cover and said counting-table surface and being adapted to receive a liquid and to feed said liquid by capillary action to the counting chamber.

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