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PIPETTE, BURETTE AND THE LIKE

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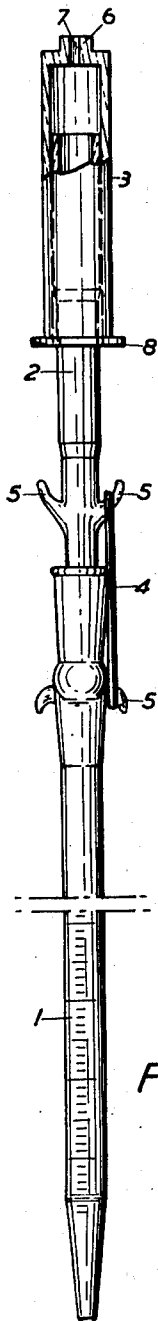


FIG. 1.

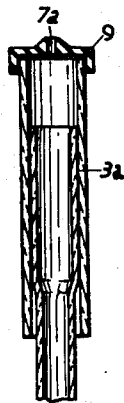


FIG. 2.

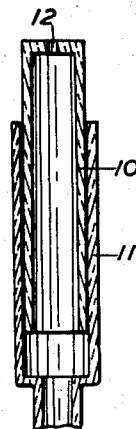


FIG. 3.



FIG. 4.

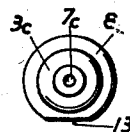


FIG. 5.

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PIPETTE, BURETTE, AND THE LIKE

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3 Claims. (Cl. 73—425.6)

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This invention relates to pipettes, such as are commonly used for the measurement and dispensing of usually small quantities of liquids in a ready and simple manner for chemical and other work. Hitherto, it has often been the practice to suck the liquid up into the pipette, with the mouth applied to the top thereof, whereby there was considerable danger that the liquid would overflow and enter the user's mouth with possibly dangerous consequences. To overcome this difficulty, pipettes have been provided with a usually manually operated syringe or suction pump device at the top end for drawing the liquid up in the tube before allowing the level to settle at the required gauge marking. However, hitherto, such syringes have caused the top end of the tube to be substantially hermetically sealed whereby, if the pumping action was not reversed during emptying, the liquid would not run out at all, or if the pump was reversed too vigorously, the liquid was forced out at a greater rate than required and to an inaccurate extent.

It should be noted that pipettes and the like are mostly calibrated in such a manner that after emptying by gravity, a small quantity is retained in the extreme end of the tube. If this remaining quantity is inadvertently forced out under pressure, the calibration is no longer accurate. Again, with such syringes, if the syringe itself happened to leak to any extent, it was not always possible to fill the pipette or the like to the upper end of its calibrated length. As a further draw-back, the single stroke capacity of the syringe had to be equivalent to the capacity of the pipette which made it a cumbersome instrument for larger sizes.

It is the object of the present invention to provide an improved construction of pipette wherein these disadvantages are overcome in a manner which will be apparent from the following description.

According to the present invention, the pipette comprises an upper tubular member, a calibrated lower tubular member connected therewith by engagement of a tapered ground end portion of the one within a tapered ground bore at an end of the other to form a ground taper joint, projections on the upper and lower tubular members, resilient connectors arranged on said projections and serving to retain the ground portions in engagement, and an apertured cylinder in slidable engagement as a push fit with the upper tubular member to form therewith a syringe for filling the pipette.

The cylinder may be engaged over or within

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the upper tubular member, and may comprise a removable cap, made for instance of rubber or like material, and containing the aperture.

The cylinder may be provided with a flange for easier manipulation with the fingers, and such flange may have a flat formed thereon to prevent the pipette or the like from rolling when placed down on a surface.

With such a construction, when the sealable aperture is closed, for instance by the finger or otherwise conveniently, the syringe means can then be used to draw liquid up in the pipette. The liquid is conveniently drawn up past the calibration to which it is desired to set the level, and is then allowed to run out down to this level, by unsealing the aperture for the requisite time.

Obviously more than one aperture could be provided if desired.

In order that the invention may be more fully understood, various embodiments thereof are shown by way of example in the accompanying drawing, wherein:

Figure 1 is an elevation of a complete pipette assembled.

Figure 2 is a vertical central section of a modified syringe portion.

Figure 3 is a central vertical section of a further modified syringe portion.

Figures 4 and 5 are plan views of details.

In Figure 1, the pipette comprises a calibrated stem 1 to which is connected, by a conventional ground joint, a tubular upper part 2 open at its upper extremity and suitably ground so as to form an accurate sliding fit within a slidable cylinder member 3. The upper part 2 and the stem 1 are retained together by resilient connectors such as the rubber band shown at 4, engaged about projections 5. At the upper extremity of the slidable cylinder member 3 there is formed a boss 6 having an aperture 7. At the lower extremity of the slidable cylinder member 3 there is provided a flange 8 for easier manipulation with the fingers.

The operation is as follows:

With the members in the position as shown in this figure, the pipette is dipped into the liquid which is to be contained therein. A finger is placed over the aperture 7 and the slidable cylinder member 3 is drawn upwardly with the same hand. This causes a reduction in pressure within the cylinder member 3 and liquid is drawn up in the usual manner. When sufficient has been drawn up to reach slightly above the calibration mark the slidable cylinder member 3 is pushed back into its original position, with the finger

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removed from the aperture 7, and before the liquid has time to drop to the calibration mark, and then the liquid is allowed to drop to the calibration mark under the control of the finger on the aperture 7. The pipette can then be removed as a whole from the liquid, and its contents allowed to pour out by gravity in the usual way. The emptying of the liquid is thus independent of operation of the slidable cylinder member 3 and the accuracy of the pipette is unimpaired.

Where the capacity of the pipette is somewhat greater than could conveniently be provided for with the slidable cylinder member 3 available for use therewith, the pipette can then be filled to the required level by successive operations of the slidable cylinder member 3. For this purpose, the slidable cylinder member 3 is used, in the manner described, for a first time as a result of which a certain amount of liquid is drawn up into the pipette. Then the aperture 7 is unsealed and the slidable cylinder member 3 is pushed back to its starting position. The liquid will only have dropped a small distance, if at all, during this action. Then the aperture 7 is sealed again with the finger and the pumping action repeated. This can be performed for as many times as are necessary to completely fill the pipette. This feature permits a relatively small and integral or separate slidable cylinder member to be used in conjunction with a large pipette or the like or with pipettes of various sizes.

In the modification shown in Figure 2, the slidable cylinder member 3a carries at its upper end a rubber or like resilient cap 9 having an aperture 7a. The action is the same as that described for the construction of Figure 1.

In the modification shown in Fig. 3, the slidable member 10 is arranged within the upper part 11 instead of external to it as shown in the previous constructions. 12 is an aperture in the top of the slidable member 10, and the action is the same as that described previously.

Figure 4 shows a plan view of a modified slidable cylinder member 3b having an aperture 7b and shown in Figure 1 but with the flange at the lower end omitted.

Figure 5 shows a plan view of a modified slidable cylinder member 3c having an aperture 7c and a flange 8c, said flange having a flat 13 formed thereon to prevent the pipette from rolling about when laid down on a surface.

With such constructions, the danger of drawing the liquid to be measured up into the user's mouth is completely avoided, and the use of the pipette is considerably simplified. When the liquid is being allowed to run out of the pipette, it does so under gravity and not through being forced out by a reversal action of the syringe. In this way, the calibration of the instrument remains accurate because the small remaining por-

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tion referred to earlier is not forced out at the end of the run-off.

We claim:

1. A pipette comprising an upper tubular member, a calibrated lower tubular member connected therewith by engagement of a tapered ground end portion of the one within a tapered ground bore at an end of the other to form a ground taper joint, projections on the upper and lower tubular members, resilient connectors arranged on said projections and serving to retain the ground portions in engagement, and an apertured cylinder in slidable engagement as a push fit with the upper tubular member to form therewith a syringe for filling the pipette.

2. A pipette comprising an upper tubular member, a calibrated lower tubular member connected therewith by engagement of a tapered ground end portion of the one within a tapered ground bore at an end of the other to form a ground taper joint, projections on the upper and lower tubular members, resilient connectors arranged on said projections and serving to retain the ground portions in engagement, a cylinder in slidable engagement as a push fit with the upper tubular member, and an apertured rubber cap carried at the upper end of the cylinder, said cylinder forming with the upper tubular member a syringe for filling the pipette.

3. A pipette comprising an upper tubular member, a calibrated lower tubular member connected therewith by engagement of a tapered ground end portion of the one within a tapered ground bore at an end of the other to form a ground taper joint, projections on the upper and lower tubular members, resilient connectors arranged on said projections and serving to retain the ground portions in engagement, a cylinder in slidable engagement as a push fit with the upper tubular member, an apertured rubber cap carried at the upper end of the cylinder, and a flange with a flat on the cylinder, said cylinder forming with the upper tubular member a syringe for filling the pipette.

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