May 17, 1949. A. G. JORDAN 2,470,353

ANALYTICAL APPARATUS

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FIG 1

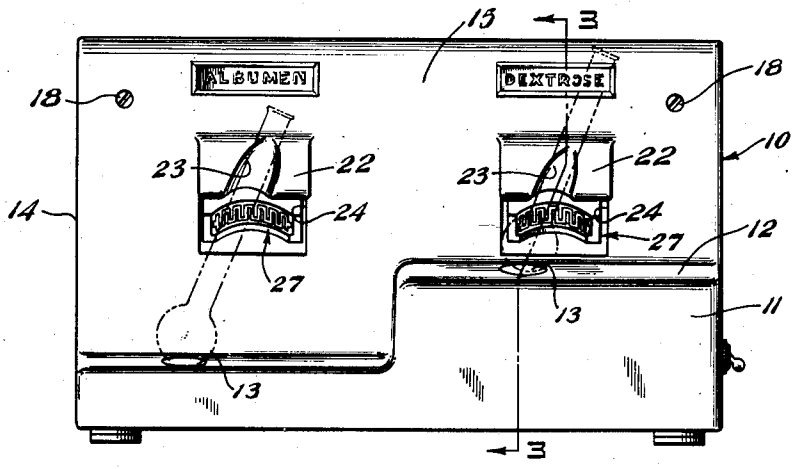
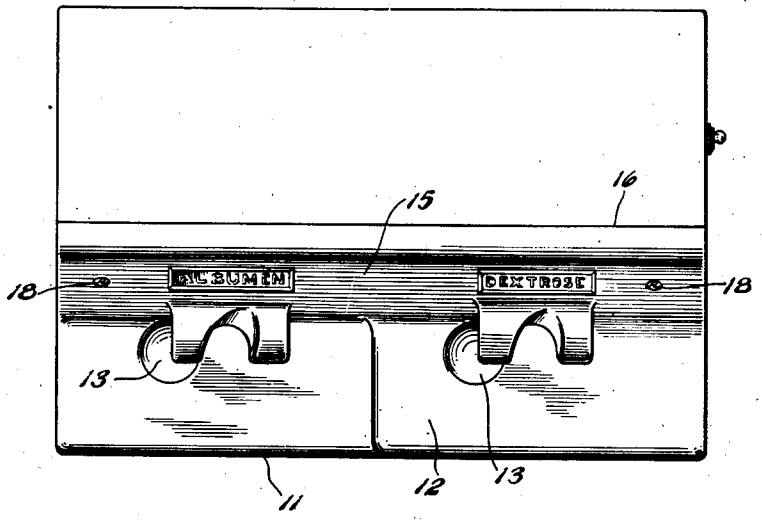


FIG 2



Inventor

Anthony G. Jordan

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

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ANALYTICAL APPARATUS

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FIG 3

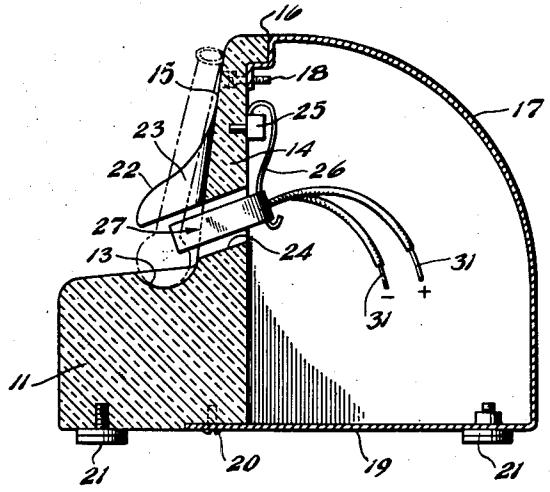


FIG 4

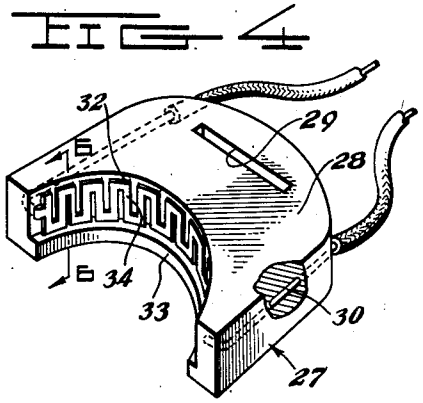


FIG 5

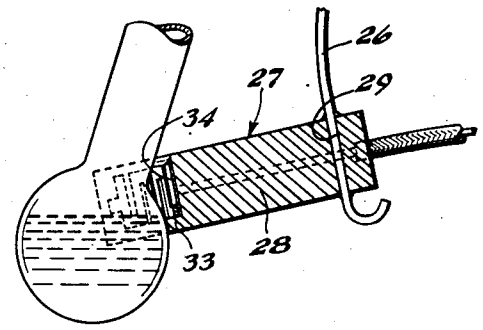
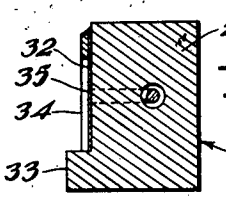


FIG 6



Inventor

Anthony G. Jordan

By *Clarence A. O'Brien and Harvey B. Jackson*

Attorneys

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2,470,353

UNITED STATES PATENT OFFICE

2,407,353

ANALYTICAL APPARATUS

Anthony G. Jordan, Battle Creek, Mich.

Application November 1, 1946, Serial No. 707,058

1 Claim. (Cl. 219—19)

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This invention relates to analytical apparatus and more particularly to a piece of equipment for use in testing urine for sugar and albumen.

The primary object of the invention is to avoid the "bumping" of the liquid during the heating thereof.

Another object is to support a container for the liquid, such as a test tube or flask, in the proper position for heating the contents thereof so that the heat may be applied to the top surface of the liquid contained in the test tube or flask.

The above and other objects may be attained by employing this invention which embodies among its features a surrounding base having a substantially horizontal top surface and a recess in the top surface, an integral flange rising from the base adjacent the back edge thereof, the front face of the flange being inclined upwardly and rearwardly from its junction with the base, an integrally formed apparatus support projecting from the inclined face of the flange in spaced relation to the top surface of the base and said support having angularly disposed groove in its outer surface to receive chemical apparatus seated in the recess and hold it at an angle to the top surface of the base.

Other features include an opening in the flange between the top surface of the base and the underside of the apparatus support and a heater disposed in the opening and formed with an arcuate recess partially to embrace a test tube or flask resting in the recess in the base and in the apparatus support.

In the drawings:

Figure 1 is a front view of the apparatus embodying the features of this invention.

Figure 2 is a plan view of Figure 1.

Figure 3 is a sectional view taken substantially along the line 3—3 of Figure 1.

Figure 4 is an enlarged perspective view of a heater embodying the features of this invention.

Figure 5 is a longitudinal sectional view through the heater illustrated in Figure 4, and

Figure 6 is a transverse sectional view taken substantially along the line 6—6 of Figure 4.

Referring to the drawings in detail this improved apparatus designated generally 10 comprises a main body or base 11 provided with a stepped top surface 12 both levels of which lie in vertically spaced substantially horizontal planes. Each level of the top surface 12 is formed intermediate its ends and substantially midway between the front and rear faces of the body 11 with a recess 13 forming a seat for a piece of apparatus, such as a test tube or flask. Rising

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from the rear edge of the base or body 11 is a flange 14 the front face 15 of which inclines upwardly and rearwardly from the junction of the flange with the base as will be readily understood upon reference to Figure 3. A rearwardly extending flange 16 is formed at the upper end of the flange 15 to which a suitable housing 17 is adapted to be attached as by attaching screws 18 which are projected through the flange as will be readily understood upon reference to the drawings. As shown in Figure 3 the housing curves rearwardly and downwardly from the flange 16 to a point substantially in alignment with the bottom face as the base 11, and then projects forwardly as at 19 to overlie a portion of the bottom of the base 11, to be attached thereto by means of suitable attaching elements 20 such as screws. Feet 21 are attached to the underside of the base, and to the underside of the bottom 19 to support the device in proper position on a bench or the like. Projecting forwardly from the inclined front wall 15 of the flange 14 is an apparatus support 22 the bottom face of which lies in spaced relation to the top surface 12 of the base 11, and each support 22 is provided intermediate its ends with an inclined groove 23 in which a piece of apparatus, such as a test tube or flask, rests as suggested by the dotted lines in the drawings.

Formed in the flange 14 adjacent its junction with the top surface 12 of the base 11 is an aperture 24 the top and bottom walls of which slope downwardly toward the front face 15, and the top wall of the opening 24 lies in a plane with the bottom face of its respective apparatus support 22 as will be readily understood upon reference to Figure 3.

Fixed to the rear face of the flange 15 directly above each opening 24 is a bracket 25 depending from which is a suspension arm 26 preferably formed of a relatively soft pliable metal, so that its lower end may be adjusted relative to the rear face of the flange 14. The lower end of the arm 26 projects downwardly across the opening 24 directly beneath the bracket 25, and supported on the lower end of each arm 26 is a heater designated generally 27. Each heater 27 comprises a body 28 of ceramic material having a slot 29 for the reception of its respective supporting arm 26, and embedded in the body 28 in spaced parallel relation adjacent opposite side edges thereof are conductors 30 the terminals 31 of which are connected through any suitable switch mechanism to a source of power supply (not shown). Formed in one end of the body 28 is an arcuate recess 32

having a flange 33 adjacent its bottom edge, and seated in the recess above the flange is a resistance grid 34, opposite ends of which are connected to the conductors 30 so that when power is supplied to the conductors the grid 34 will become heated. As illustrated in Figure 3 each heater projects through an opening 24 and is adapted partially to embrace a test tube, flask or like piece of apparatus which may be resting in a recess 13 and in the groove 23 of the respective apparatus holder 22. When in this position the flange 33 will prevent the grid 34 from contacting the surface of the test tube or flask which is to be heated. The grid 34 is cemented as at 35 (Figure 6) to the wall of the recess 32 with any suitable ceramic cement which will resist disintegration under the effect of the heat produced by the grid.

In use it will be understood that a test tube, flask or the like is seated in a recess 13 with the stem of the test tube or other piece of apparatus lying in the groove 23 of the apparatus holder immediately above the recess 13. Due to the fact that the recess 13 is slightly off-set with relation to the holder 22 immediately thereabove, and that the groove 23 in the holder is inclined to one side it will be obvious that the test tube or like piece of apparatus will be held so that its longitudinal axis leans to one side of the perpendicular. Likewise due to the inclination of the front face 15 of the flange 16 toward the rear of the device the test tube or like piece of apparatus will tilt rearwardly so that it will assume substantially the positions indicated in the dotted lines in Figures 1 and 3. Upon connecting the terminals 31 of the conductors 30 with a suitable power supply, the heater grid 34 will become heated and the radiations therefrom will be absorbed in the liquid contained in the test tube or like piece of apparatus above the bottom, so that any tendency of the liquid toward violent ebullition or "bumping" will be avoided, and the determinations may be carried forth without interruptions.

While in the foregoing there has been shown and described the preferred embodiment of this invention it is to be understood that minor changes in the details of construction, combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as claimed.

What I claim is:

Analytical apparatus which includes a base having a substantially horizontal top surface and a recess in the top surface, an integral flange rising from the base adjacent one side edge, the face of the flange joining the horizontal top surface being inclined upwardly and rearwardly as it recedes from its junction with the base, an apparatus support projecting outwardly from the inclined face of the flange in spaced relation to the top surface of the base, said support having an angularly disposed groove in its outer surface to receive chemical apparatus seated in the recess and hold it at an angle to the top surface of the base, said flange having a downwardly and forwardly inclined opening therein immediately below the bottom surface of the apparatus support, a heating device removably supported in said opening, said heating device having an arcuate recess therein partially to embrace a piece of chemical apparatus seated in the recess in the base and an electrically energized heating unit in said recess.

ANTHONY G. JORDAN.

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