Completely Adjustable Multipurpose Agar Gel Cutter

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Recent progress in the study of antigen-antibody reactions of biologicals in agar gel demands improvement of existing gel-cutting devices. For an ideal comparison of two or more antigenic preparations against an antiserum, it is necessary to obtain a critical distance between the antigen and antibody cups and to obtain a partial or complete identity of precipitinogen in adjacent cups. However, none of the available gel cutters (Feinberg, Intern. Arch. Allergy 11:129, 1957; 16:1, 1960; Crowle, Immunodiffusion, Academic Press, Inc., New York, 1961) meet the following two requirements to obtain the above-mentioned ideal comparison: (i) that the distance between the central cup and the peripheral cups be adjustable, and (ii) that the distance between the two adjacent peripheral cups be adjustable. Thus, when we were investigating viral antigenic subunit destruction by various enzymes, we encountered difficulty in obtaining partial or complete identity with commercially made cutters or previously designed templates. Therefore, we designed and fabricated a single-unit, multipurpose gel cutter which does not require maintenance, is easy to operate and keep clean, and has interchangeable plungers of different diameters for micro and macro reagents.

Figure 1 shows our gel cutter with an additional plunger, and a gel plate with seven equidistant cups. Figure 2. Exploded view of gel cutter. (1) Sliding plunger retainer, ⅜ in. drill hole; (2) round head machine screw, stainless steel, 4-40 1 in. long; (3) plunger cutter, stainless steel, wall thickness 0.040 in., ⅛ and ⅜ in.; (4) cover plate, 1 by 1 by ⅛ in.; (5) thumb screw, stainless steel 8-32 ⅜ in. long; plunger retainer guiding bar, stainless steel, ⅜ by ⅜ by ⅜ in.; (7) guiding bar end blocks ⅜ by ⅜ by 1 in.; (8) dividing ring, outer diameter 4⅜ in., inner diameter 4⅜ in.; (9) guide blocks (outer), ⅜ by ⅜ by ⅜ in.; (10) base, outer diameter 6⅜ in., ⅛ in. thick; (11) petri dish; (12) guide blocks (inner), ⅜ by ⅜ by ⅜ in.

FIG. 1. Completely adjustable multipurpose agar gel cutter.

FIG. 2. Exploded view of gel cutter.
distant wells made by the gel cutter. Figure 2 shows the exploded assembly of the entire unit, and Fig. 3 shows top and side views of the unit.

The gel cutter is made of Lucite, so the entire operation can be observed. The ring, with attached vernier arms with plunger, is separable from the base plate with petri dish containing agar gel. Thus, it is easy to remove and insert a new petri dish. If required, cut gel could be removed from the cup by inserting the long cannula, with the rubber tubing from suction source with trap, through the long plunger head. The plunger is spring-loaded, and there is no difficulty in gel cutting. The lower end of the plunger is caved inward to cut the edge of the gel smoothly and to let the gel slip inside the stainless-steel tube. The unit can be sterilized by ultraviolet light.

The described gel cutter has been successfully used in obtaining complete identity of meningo-pneumonitis virus subunits (Parikh and Shechmeister, Virology, 22:177–185, 1964).

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ERRATUM

Kinetics of Death of Bacterial Spores at Elevated Temperatures

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Vol. 12, no. 5, page 452, col. 2: change equation 4 to:

\[ k = \Delta e^{-\Delta E/RT} \]