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[54] **MINI-TEST DISH**

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[73] Assignee: **The United States of America as Represented by the Secretary of the Department of Health, Education and Welfare.**

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[52] **U.S. Cl.** **195/103.5,** 195/140, 229/15, 220/22.1

[51] **Int. Cl.** **C12k 1/00**

[58] **Field of Search**.....195/127, 139, 139 LE, 140, 195/103.5; 217/22, 30; 229/15, 29 D, 29 M, 28; 206/65, 65 E, 65 Y; 220/22, 22.1

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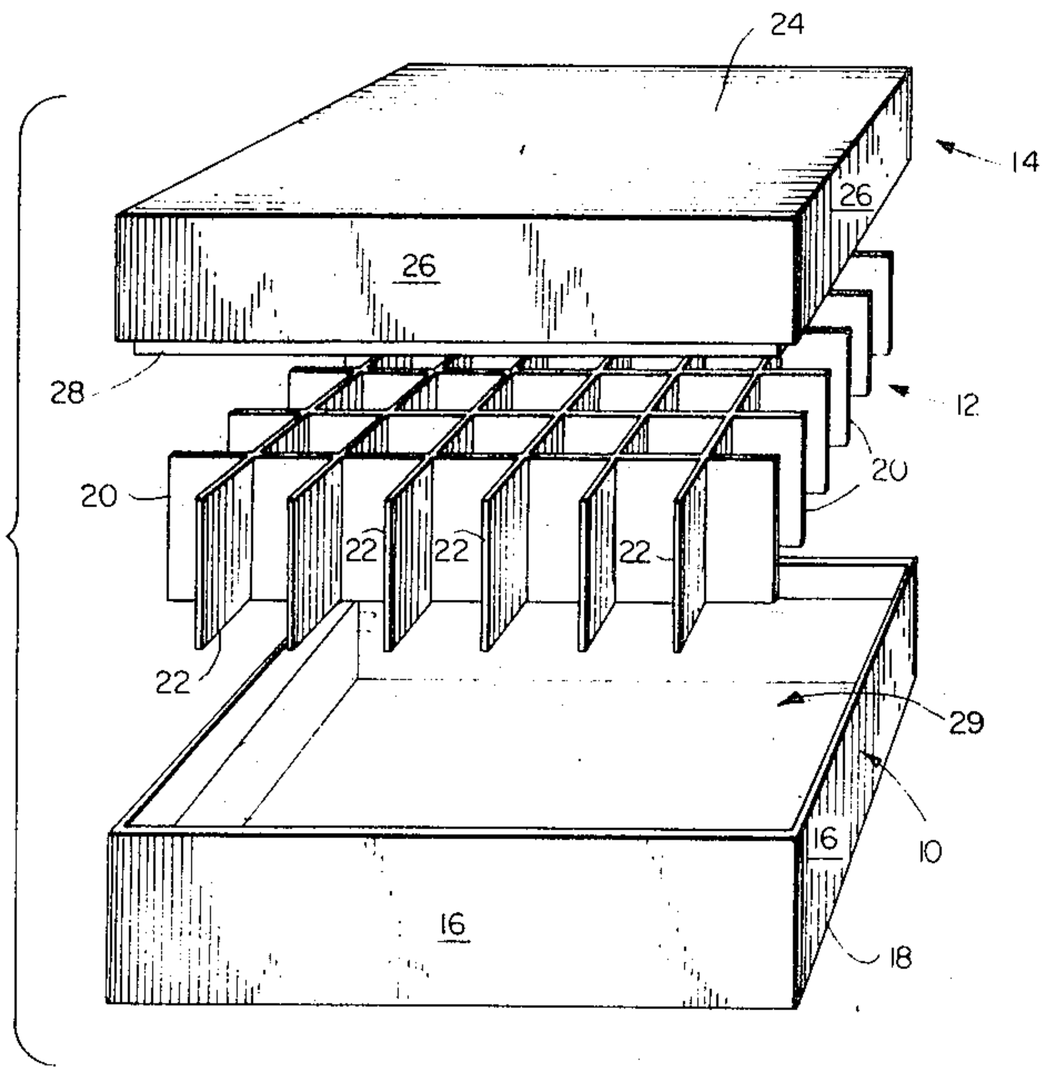
[57] **ABSTRACT**

A method and apparatus for multiple test cultures having an open-topped container and a cover forming a dust-proof enclosure therewith. The container is partly filled with a culture supporting medium and a dividing member is inserted therein to divide the medium into plural open-topped test areas of equal volume. Cultures are then introduced into the various test areas to provide simultaneous multiple tests in the same support medium.

4 Claims, 2 Drawing Figures



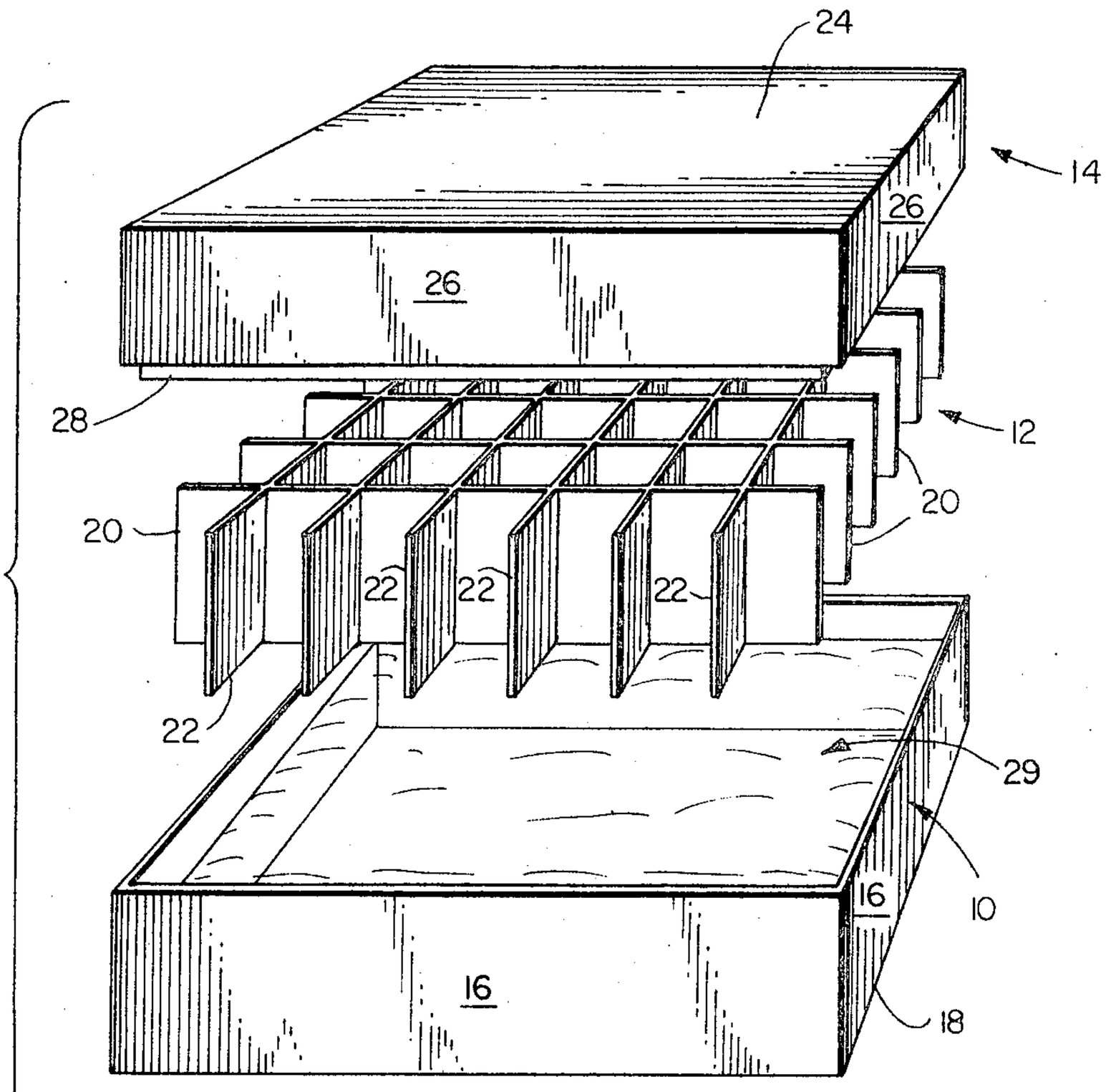


FIG. 1

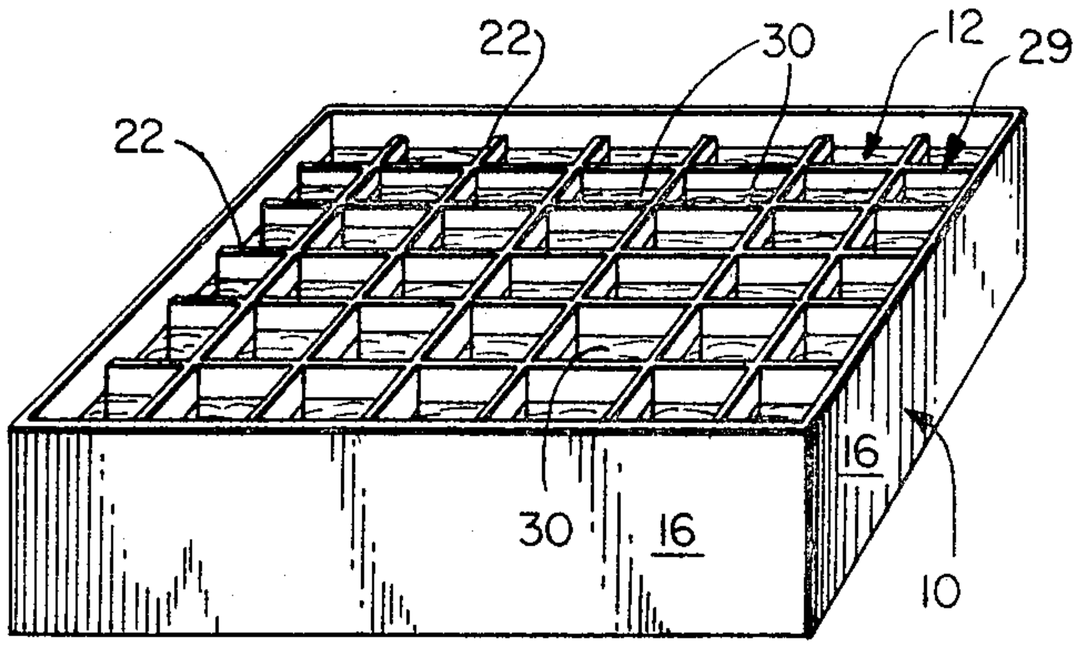


FIG. 2

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MINI-TEST DISH

BACKGROUND OF THE INVENTION

In diagnostic and bacteriological laboratories, the classification of bacteria and certain other microorganisms is usually based on their biochemical properties.

In the routine testing and identification of unknown strains, it is necessary to make multiple tests to determine such properties as: acid production from fermentation of carbohydrates; growth using certain known compounds as energy sources; the production of extracellular enzymes; vitamin, amino acid and other nutritional requirements; inhibition by antibiotics and other chemicals; pigment production on various media; biochemical changes brought about by specific enzymes; and growth at various pH's.

It is common in the present art to conduct such tests in individual tubes supplied by manufacturers with the required media, ready for a single test. Such apparatus has proved to be greatly beneficial to laboratories due to the savings in preparation time and material required to conduct these multiple tests. The costs involved, however, are excessive in that the individual tubes and the time and care required in preparation thereof impose high production costs on the manufacturer.

Petri or culture containing dishes having compartmentalized interiors are also available for conducting the multiple testing described above. Such compartmentalized dishes offer advantages in material cost over the individual tubes; however, each compartment must be filled individually with warm media which, even with automatic pipetting devices, is a time consuming step. Where more than one medium is to be used in filling the dish, a separate filling device must be used for each medium and it is difficult and time consuming to provide a consistent proportion of media in each compartment.

SUMMARY OF THE INVENTION

This invention provides a multiple test dish type culture container which overcomes the disadvantages of the prior art by furnishing a container which is filled with the culture supporting medium which is subsequently divided into separate and equal test volumes within the container.

The invention also provides a multiple test culture container in which plural test cultures of equal volume and constant composition are easily and quickly provided by furnishing a device in which the support medium is composed as a whole in a container and subsequently divided, in situ, into separate and equal test volumes by insertion of a divider comprised of sets of intersecting, parallel, equally spaced dividing walls.

In a preferred embodiment, the invention comprises an open topped container or tray having a bottom and substantially vertical side walls; a divider member including intersecting sets of equally spaced, uninterrupted, parallel walls of less vertical extent than the extent of the container side walls and configured or so dimensioned relative to the container or tray as to be removably disposed in the container to fit closely with the walls thereof and divide the interior into plural, open-topped compartments of equal volume; and a cover member configured to engage the upper edges of the side walls to form a substantially airtight enclosure with the container.

These and other objects and many of the attendant advantages of this invention will become better understood to those skilled in the art by reference to the following detailed description when viewed in light of the accompanying drawing wherein like components throughout the FIGURES thereof are indicated by like numerals and wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an exploded perspective view of a device in accordance with the invention; and

FIG. **2** is a view similar to FIG. **1** showing a portion of the device in an assembled, in-use configuration.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIG. **1**, the device is illustrated and is comprised of three major portions, generally indicated as an open topped container **10**, a dividing member **12** and a cover member **14**.

The container **10** is provided with substantially vertical side walls **16** and a bottom **18** which define a square, substantially sharp-cornered box. The dividing member **12** is comprised of two sets of equally spaced parallel walls **20** and **22** which intersect one another at right angles. The dividing member is configured to fit snugly within the confines of the container **10** such that the interior of the container is divided into compartments of equal volume by the intersection of the dividing member **12** and by the peripheral portion of the dividing member and the walls **16** of the container. It is important that the compartments formed by the divider be substantially equal in volume in order to maintain constant relationships in tests conducted in the various compartments. In this respect, the verticallity of the walls **16** is important in that the peripheral compartments would be of different volume than the interior compartments if their orientation were other than vertical.

The cover **14** is composed of an upper wall **24** and depending edge walls **26**. The lower edge or horizontally extending continuous shoulder of the walls **26** is provided with a lip **28** which fits snugly against the inner surfaces of the side walls **16** of the container **10** to thereby provide a substantially airtight relationship between the container and the cover **14** when the components are joined In other words, the closure or cover has a closed top and the depending edge or side walls include the lip **28** that constitutes a depending, continuous, uninterrupted side wall portion having external dimensions and an external configuration so related to the internal dimensions and configuration of the vertical side walls **16** of the tray as to closely fit therewith to isolate the compartments of test areas from contamination by ambient conditions.

The above-described components are preferably fabricated of a plastic which is compatible with the use environments and which can be sterilized by ethylene oxide, for example. If the plastic used is thermostable, the device could be autoclavable and re-usable.

Although the device can be fabricated in any size and capacity desired, a device having container dimensions 160 by 160 mm. and a height of 15 mm. has been found to be particularly suitable for the purposes of this invention. Such a container has a cover **14** which is 165

by 165 mm. and 10 mm. in height with a divider **12** which is 12 mm. in height and having walls **22** on the order, for example, of 0.5 to 2 mm. in thickness. With sets of six equally spaced walls in each direction, 49 equal and square compartments 20 mm. on each side are formed within the container **12**.

In operation, bacteriological test agar or semisolid agar is sterilized and cooled to between 45° and 50°. A layer **29**, approximately 7 mm. in thickness, is aseptically poured into the container **10** and, referring now to FIG. **2**, while the agar **29** is still warm or in the semisolid condition, the divider **12** is lifted with sterile forceps and is fully inserted to divide the agar into plural test areas **30**. The unit is then cooled, preferably aseptically by air passed through filters such as in a laminar-flow cabinet, to cool and solidify the agar in the test areas **30** into a hard gel.

Many of the tests now performed in liquid media could be adapted to a 1.5 percent agar or semisolid medium and then performed in the device of this invention. By having the tests confined by the walls **22** of the divider **12**, diffusable substances such as acids, alkali, enzymes, small molecules, etc., precluded from interfering with tests performed in adjacent test areas **30**.

When the device is prepared, the cultures and/or materials to be tested are deposited in individual test areas and the cover **14** is emplaced to as mentioned previously, isolate the tests from contamination by ambient conditions.

With a device of the above dimensions, 49 individual tubes of the prior art are replaced and the resultant material costs of the tests are reduced by 90 percent. The reduction in labor time, costs and improved consistency over the prior art permanently divided dish described above are obvious.

Although the device has been specifically described above as being rectangular, the container **10** and cover **14** could, within the scope of the invention, be circular or otherwise shaped. In the event the container is circular, the dividing member **12** could be comprised of a plurality of radially extending walls intersected by annular, coaxial walls such that the plurality of compartments of equal area are formed thereby.

What is set forth above is exemplary of a teaching in accordance with the invention to enable those skilled in the art in the practice thereof.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. The method of conducting a multiple test culture comprising the steps of pouring a layer of semisolid culture media at a temperature of approximately **45°–50°C** into a sterilized open-topped container, maintaining the temperature of said media, inserting a sterilized dividing member comprising intersecting sets of equally spaced parallel walls into said container to divide said media into plural individual test areas, cooling said media in a sterile environment to provide gelling thereof, depositing test material into the various test areas to conduct simultaneous separate tests thereof, and covering said container to render the interior thereof substantially airtight.

2. A test assembly for facilitating multiple testing of biochemical properties of microorganisms, in diagnostic and bacteriological laboratories embodying three components of plastic material compatible with the environment of testing usage and sterilizable to be reusable; said components comprising a tray having a closed bottom and a continuous, uninterrupted substantially vertical side wall portion; a divider member including cooperative intersecting sets of equally spaced uninterrupted divider walls defining interstices of substantially equal cross-sectional area, said divider walls having less vertical extent than the extent of said vertical side wall portion, said divider member being so dimensioned relative to said tray as to be removably insertable within said side wall portion in a close-fit relationship to define therewith and within said tray a plurality of open-topped compartments of equal volume adapted to confine a layer of culture supporting medium into a like plurality of individual equal volume test areas for receiving test material; and a closure including a closed top and at least a depending, continuous, uninterrupted side wall portion having external dimensions and an external configuration so related to the internal dimensions and configuration of said vertical side wall portion of said tray as to closely fit therewith to isolate such test areas from contamination by ambient conditions.

3. A test assembly as claimed in claim **2** in which said vertical side wall portions having an upper edge portion and said closure further including a horizontally extending continuous shoulder adapted to engage said upper edge portion.

4. A test assembly as claimed in claim **2** in which said tray is rectangular, said divider walls of each set being parallel, and said sets of divider walls intersecting one another at approximately **90°**.

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