Nov. 14, 1972 W. E. OLIVA 3,702,806

DISPOSABLE CULTURE MEDIA CONTAINER

Filed Sept. 3, 1970

FIG. 1

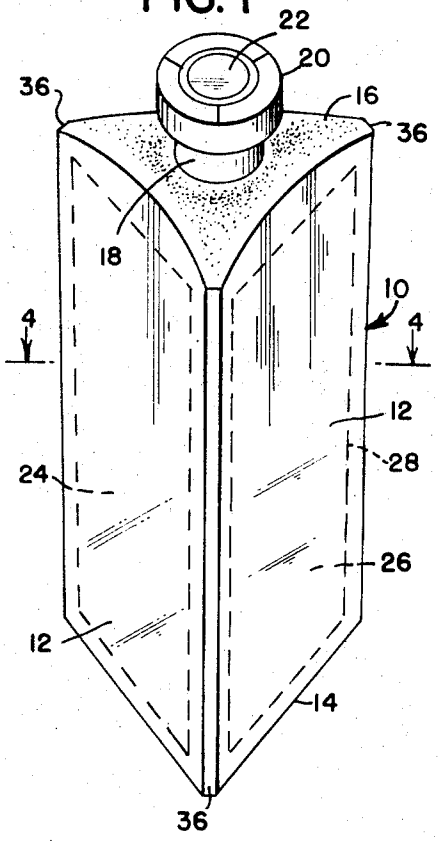
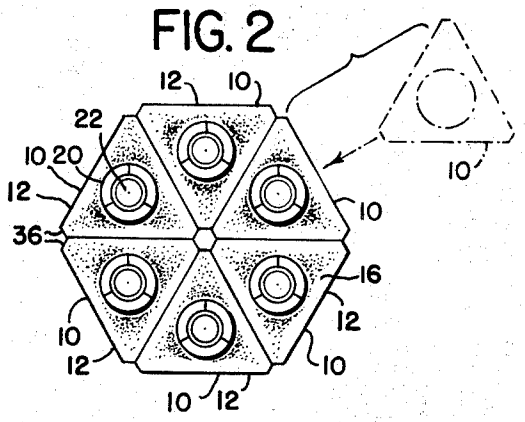


FIG. 2



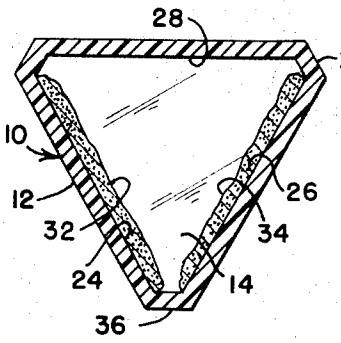
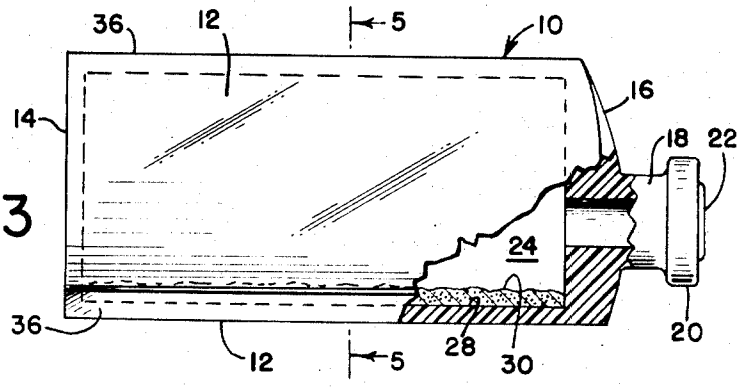


FIG. 4

FIG. 3



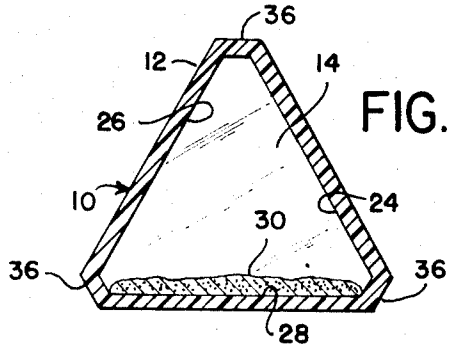


FIG. 5

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DISPOSABLE CULTURE MEDIA CONTAINER

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Continuation-in-part of application Ser. No. 786,833, Dec. 18, 1968, which is a continuation of application Ser. No. 547,609, May 4, 1966. This application Sept. 3, 1970, Ser. No. 69,484

Int. Cl. C12b 1/00

U.S. Cl. 195—139 4 Claims

ABSTRACT OF THE DISCLOSURE

A triangular-shaped disposable environmental culture media container comprising a bottle having an elongated body portion with three flat side walls spaced from each other in triangular transverse cross section to cooperatively define a sealable container for carrying a plurality of culture media in fixed spaced relationship without breaking away from said side walls.

CROSS-REFERENCES TO RELATED APPLICATIONS

This is a continuation-in-part application of application Ser. No. 786,833, filed Dec. 18, 1968, which in turn is a continuation of application Ser. No. 547,609, filed May 4, 1966 both now abandoned.

This invention relates to a disposable environmental culture chamber and more particularly to an improved triangular-shaped culture chamber adapted to provide for viewing a plurality of agar media and a broth media through bottle defined by three equilateral transparent plastic gel retaining walls.

In the past it has been the practice in various biological tests to transfer a bacteria containing substance to a closed chamber provided with a nutrient upon which the bacteria from the substance thrived for identification and further analysis. Such a test is discussed in the patent to Belcove, U.S. Pat. No. 2,992,974 issued July 18, 1961. As indicated in the Belcove patent, a testing device of the type described has become available wherein two different nutrients are provided in a single container. The substance to be tested is introduced into a container wherein a nutrient broth and a second nitrient in gel form provides the culture environment. Because of their configuration, most culture chambers of this type are unable to maintain the two different culture media in a suitable spaced relationship for nurturing separate test samples. Additionally, in the past it was possible to provide only a single agar slant in a container together with a nutrient broth. Even under these conditions, there was danger of the agar slant breaking from the wall of the container. To utilize, as layer engaging means, various gripping means or other such supporting appendages formed on the inner wall of the container thus met with difficult. It is recognized that in such a device, especially during shipment, the agar slant could not withstand the forces brought about by movement of the container. The apparent result of such jarring caused the congealed gel slant to break and fall from the wall of the chamber into the nutrient broth, were such broth provided.

In addition, the prior art test chambers, such as that of Belcove, accommodate only one gel medium in combination with a single broth for test purposes. Further, viewing through the walls of such containers is difficult in

that the viewing distance is relatively great and the container can only be positioned in one way with the viewer in a predetermined position. In biological testing it is not uncommon to have a plurality of samples undergoing similar testing in the laboratory. Where such was the case, there had to be provided as many vessels as there were samples. Transfer of bacteria from one culture media to another (of a different composition or different environment) was not possible. This impediment to efficient experimentation greatly restricted the use of environmental culture chambers despite their obvious advantages. One of the difficulties thus faced by the investigator in the field of culture study is the expense necessitated to provide complete culture studies when a duplication of constant test environment and multiplicity of equipment is required. Further, it has been extremely difficult in the past to standardize results gathered from a plurality of test containers requiring scientifically significant variations in sterility and other experimental variables.

In many applications where it was desired to identify and/or quantify bacteria presence, a plurality of chambers were utilized wherein attempts were made to maintain consistent atmospheric conditions. As is the case with any test procedures, limitation of variable aids accurate analysis. Further, where a plurality of chambers is required, the danger of contamination is obviously more pronounced than if all of the test media are contained in a single closed system. Such a plurality of chambers are even required where subculturing techniques are employed. By utilizing the test procedures described herein, it is possible both to identify and to culture bacteria within a suitable medium. In order to culture unknowns in a suitable medium, it has in the past been necessary to utilize several test containers. This is necessary since certain bacteria will culture more readily in a favorable medium. It has thus been necessary to select at random different test media representing those most likely to afford such culturing.

A primary object of this invention is to provide a new and improved environmental culture chamber of the type disclosed wherein a single or a plurality of media, which can be liquid, solid or a combination of liquid and solid media, are provided in fixed spaced relationship within a single chamber.

Another object of the invention is to provide a culture chamber of substantially triangular cross-section adapted for viewing of a plurality of culture media with improved optical clarity by virtue of its three-sided configuration.

Another object of this invention is to provide a culture chamber wherein organisms may be passed between different media by tilting the containers, thereby obviating the necessity for opening the container to accomplish such passage of organisms.

Still another object of this invention is to provide a relatively compact strong and easy to handle culture chamber adapted for autoclaving without hazard of explosion or fragmentation.

A further object of the invention is to provide a culture chamber wherein three distinct agar gel slants are provided within a single chamber having a nutrient broth therein.

Another object of this invention is to provide a disposable environmental culture chamber having agar gel slants disposed therein and adapted for shipment without danger of slant fracture or breakage.

Still another object of this invention is to provide a closed system of biological test media for determination

of a plurality of results through observations of a single test chamber.

Another object of this invention is to provide a culture chamber formed of an optically clear plastic having an optically clear slant comprising a relatively thin layer of culture media provided upon each of the walls of the chamber.

Another object of this invention is to provide a means of identifying and culturing micro-organisms in an anaerobic or aerobic environment in a single vessel.

Further objects and advantages of this invention will be apparent from the following detailed description taken in connection with the accompanying drawings in which:

FIG. 1 is a perspective illustration of the culture chamber of the present invention;

FIG. 2 is a plan view of a plurality of the chambers of FIG. 1 provided in a group for compact stacking and viewing;

FIG. 3 is a longitudinal elevational view, partly in section, of the container of FIG. 1 illustrated resting upon one of its walls;

FIG. 4 is a sectional view taken on lines **4**—**4** of FIG. 1 and shows two agar gel layers in position upon two of the inner side walls of the chamber and

FIG. 5 is the sectional view taken on lines **5**—**5** of FIG. 3.

Referring now to the drawings; FIG. 1 shows a disposable environmental culture chamber generally indicated by the reference numeral **10** formed of a transparent plastic material and including three equilateral side walls **12** which define a body portion substantially triangular in transverse cross-section. The chamber **10** has a substantially flat base portion **14** and a top portion **16**. A vertically extending cylindrical neck **18** is formed at the upper end **16** of the container **10**. A pierceable-resealable cap **20** is provided upon the neck **18**. The cap **20** has, at the center portion thereof, a pierceable member **22** to receive a needle, spike or like device for depositing a sample to be tested within the chamber which is normally provided with less than atmospheric pressure. Depending upon the media present, or the sample to be tested, the chamber **10** may contain other suitable environment such as carbon dioxide or nitrogen. The pierceable member **22** is formed of a resealable material so that upon withdrawal of the instrument used to deposit the sample, the chamber is effectively closed to maintain the sterility thereof and vacuum therein. The inner walls **24**, **26** and **28** of the container **10** are substantially flat.

A nutrient broth (not shown) may be provided within the container **10**. The nutrient broth would be present in a quantity necessary to provide the culture environment in which a test sample would thrive.

It will be understood that in certain tests, the technician would desire to deposit only a liquid broth in the chamber. By the same token, a single thickness of gel media might be provided. The chamber **10** may be evacuated where it is desired to conduct tests in a less than atmospheric environment. In certain instances, it is also desired to conduct the tests in a chamber at atmospheric pressure. In either event, because of the closed system provided by the present invention, either anaerobic or aerobic environmental techniques may be utilized.

In FIG. 2 a plurality of containers **10** are illustrated in stacked configuration resembling a hexagon. It will be understood that this is to illustrate the means used to view through a plurality of sides of individual containers when they are placed in the space saving manner as illustrated. One of the containers **10** is illustrated in phantom.

FIG. 3 shows the disposable environmental culture chamber of FIG. 1 resting upon one of its walls **12** and containing an agar gel layer or slant **30** therein. The container is illustrated in this manner to show the position of the container **10** with liquid medium within the container prior to its solidification. Once the gel sets or congeals,

the container is stood in its upright position as indicated in FIG. 1. The test sample is placed upon the gel after it "solidifies."

FIG. 4 is a sectional view taken on lines **4**—**4** of FIG. 1. Disposed within the container **10** upon the walls **26** and **24** are agar gel layers **32** and **34**. The wall **28** may likewise receive such a layer. A slant is intended here to indicate a layer of variable thickness from top to bottom.

FIG. 5 is a sectional view taken on lines **5**—**5** of FIG. 3 and shows the container **10** having a single culture medium slant or layer **30** provided therein. The inner walls **24** and **26** are joined by a bridge portion **36**. A similar bridge **36** is found at the inner facing base of the walls **26** and **28** and the walls **24** and **28**. In this manner the several agar slants (only one shown) provided within the chamber abut but are not co-mixed as a single medium layer. The abutment of several agar slants at the acute angles of the walls of the triangular-shaped chamber uniquely promotes the adherence of the agar slants to these walls without supporting appendages such as the gripping means of Belcove. The culture chamber can thereby be placed in transit and shipped without danger of slant fracture or breakage.

In operation the container **10** is placed in the position shown in FIG. 5 for receipt of an agar gel or inspissated type culture medium. The culture medium **30**, when solidified, is held upon the inner wall **28** of the chamber **12** by means of the acute angles of the adjacent inner faces **24** and **26** of the container **10**.

In the event it is desired that two culture media slants or layers are provided, the container **10** is turned upon another of its side walls **26**. In this position a second culture medium layer is provided within the chamber upon the inner wall **26**. In FIG. 4 the sectional illustration shows two such slants or layers in position within the chamber. A nutrient broth culture medium (not shown) may then be provided within the chamber **10**. The nutrient broth may be provided in the container **10** with the container **10** resin in the upright position. After the provision of layers and broth in the container, the container will be evacuated by suitable means so that it contains a less than atmospheric pressure and the atmosphere can be adjusted to include desired gases.

It will be understood that when the liquid gel medium is placed into the chamber **10**, a predetermined thickness may be provided. In this manner, each of the walls **24**, **26** and **28** may carry a different thickness as well as a different composition of nutrient layer. Even with three layers and a broth nutrient, culture growth may be readily observed in all four media through the transparent walls of the container **10**. In this manner, the space saving objective is accomplished.

While I have described in detail preferred embodiments of the invention, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit and scope of the invention.

What is claimed is:

1. A triangular-shaped disposable environmental culture media container comprising a bottle having:

(A) a narrow closure means provided at the top to allow test sample deposit therethrough,

(B) a solid bottom,

(C) an elongated transparent body portion with three substantially flat side walls having no solid culture media-supporting appendages and spaced from each other in substantially equilateral triangular transverse cross-section to cooperatively define a sealable container with bridge portions between said walls whereby a plurality of culture media can be maintained in fixed spaced relationship without breaking away from said walls, and whereby observation of microscopic colonies on said culture media can be performed with improved optical clarity, and

(D) at least one of said side walls carrying on its inner surface a solid culture medium for microorganisms.

2. The container of claim 1 in which a liquid nutrient broth culture medium is provided therein.

3. The container of claim 1 in which two of said side walls carry solid culture media for microorganisms on their inner surfaces.

4. The container of claim 1 in which three of said side walls carry solid culture media for microorganisms on their inner surfaces.

References Cited

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ALVIN E. TANENHOLTZ, Primary Examiner

U.S. Cl. X.R.

195—103.5; 220—23.4