

Aug. 31, 1965

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3,203,870

MICROORGANISM SAMPLING DEVICE

Filed July 23, 1962

FIG. 1

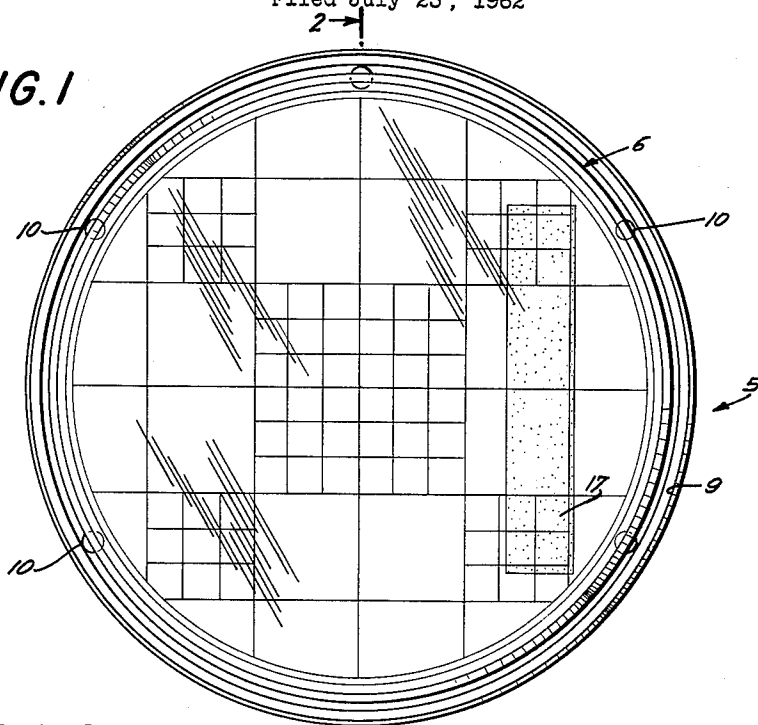


FIG. 2

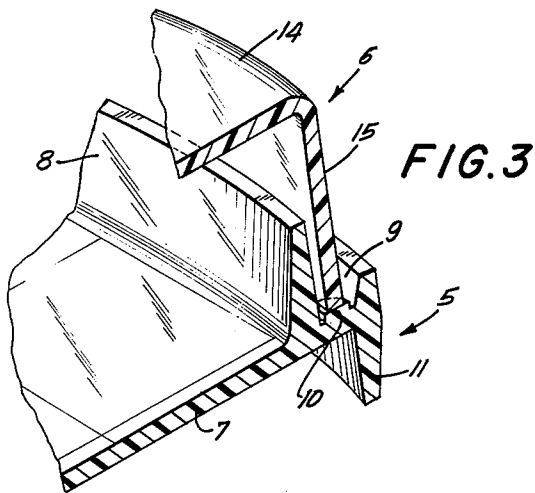
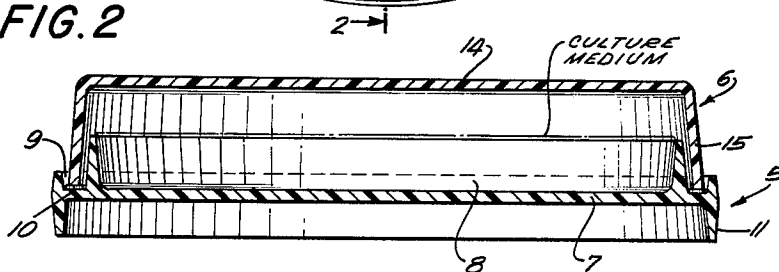


FIG. 3

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MICROORGANISM SAMPLING DEVICE

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Filed July 23, 1962, Ser. No. 211,745

2 Claims. (Cl. 195-139)

This invention relates to an improved microorganism sampling device and method and to an improved culture dish which is particularly useful in checking various surfaces for the presence or absence of microorganisms or for the identification of specific microorganisms found thereon.

It is necessary or useful to check various surfaces for the presence, absence or identification of microorganisms. Thus, checks of this type are made of the walls, floors and ceilings of hospital rooms, laboratories, sterile rooms, food processors, restaurants and other similar places. Similar checks may be made with regard to operating tables, the counters and benches of laboratories and sterile production rooms and other similar surfaces.

At the present time a sampling is made of the surface to be tested and then placed in a sterile tube or container and transported to a laboratory where it is transferred to a culture medium in a culture dish.

In addition to the expense and time of a skilled technician required to make the sampling to preserve the sample in sterile condition and to make the transfer to the culture dish, substantial opportunity and danger exists for loss of all or part of the sampling or for contamination thereof with microorganisms from other sources.

It is a particular object of the present invention to overcome the difficulties and disadvantages heretofore encountered and to provide an improved sampling device and method for testing surfaces for the presence, absence or identification of microorganisms whereby the sampling of the surface is taken directly in the culture medium of my improved culture dish, thereby eliminating the necessity of sterile storage and transportation of the sample with subsequent transfer to a culture medium.

A further object is the provision of a novel culture dish of improved construction which is particularly useful in taking samplings from a surface, which may be used in the culturing of most types of microorganisms, and which is relatively simple to use so that laboratory technicians and nurses can readily employ the device.

In carrying out my invention I provide an improved culture dish having a base plate and an upstanding wall with cover supporting means surrounding the wall. The cover is provided with a top plate and with depending walls which surround and overlap the upstanding wall of the dish and are supported on the supporting means. The depending wall of the cover is of greater height than the upstanding wall of the dish so that the top plate of the cover bridges over and is spaced above the wall of the dish. When used as a microorganism sampling device, the dish is filled with a relatively stiff self-supporting culture medium which projects above the level of the upstanding walls of the dish. Thus, the dish can be manipulated to impress the culture medium against the surface to be sampled. When the cover is applied to the dish, it not only bridges over the upstanding walls of the dish but is also spaced above the culture medium. Thus, the sampling may be taken directly in the culture medium of the

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culture dish, the cover applied thereto and thereafter the assembly can be placed in a suitable thermal environment for the microorganisms being checked or tested. After a suitable lapse of time, the dish can then be checked for the presence of microorganisms and a count can be made thereof.

In the accompanying drawing:

FIG. 1 is a top plan view of a microorganism sampling device embodying my invention in the form of a culture dish having a cover member applied thereto;

FIG. 2 is a cross-sectional view of the assembly in the direction of the arrows on the line 2-2 of FIG. 1 and indicating the level of the culture medium in the culture dish when it is used as a microorganism sampling device; and

FIG. 3 is a fragmentary perspective view partially in section on an enlarged scale showing the manner in which the wall of the cover member is supported in the cover supporting channel of the culture dish.

My improved microorganism sampling device comprises generally a culture dish 5 and a cover member 6. The dish and cover member may be made of any suitable material such as a plastic or resin material inert to and unaffected by the culture medium employed therein and the microorganisms to be tested and cultured therein. In this connection, I have found that polystyrene serves very satisfactorily since it not only is inert but also has good optical qualities. However, it should be understood that polypropylene and polyethylene and other plastics may also be employed and that the device may also be made of glass.

The culture dish 5 comprises generally a base plate 7 which is preferably relatively flat and in the illustrated embodiment is of circular configuration. An upstanding wall 8 extends continuously around the dish adjacent the periphery thereof and, as shown, is preferably formed integrally with the base plate. Surrounding the upstanding wall 8 I provide suitable cover supporting means, preferably in the form of the upwardly facing channel portion 9. In the base of the channel portion I preferably provide a plurality of projections 10 on which the base of the cover wall may rest so as to minimize frictional adherence between the lower edge of the cover wall and the base of the channel. Surrounding the dish and depending downwardly from the channel portion thereof is the rim 11 which may serve as a handle for gripping and manipulating the culture dish so that it can be readily impressed against a surface which is to be sampled.

The surface of the culture dish may be provided with suitable lines or a grid, as shown, so as to facilitate counting of the microorganisms in the usual manner.

The cover member comprises a relatively flat top plate 14 with a depending wall 15 extending around the periphery thereof and formed integrally therewith. The depending side wall 15 of the cover member is of such a size and configuration that it surrounds and overlaps the upstanding wall 8 and rests in and is supported by the upwardly facing channel 9 of the culture dish. In addition, the depending wall 15 of the cover member is of somewhat greater height than the upstanding wall 8 of the culture dish so that the top plate 14 of the cover member bridges over and is spaced above the upstanding wall 8. In this connection, the height of the depending wall 15 of the cover member should be such that the top plate 14

also bridges over and is spaced above the culture medium in the culture dish.

Thus, in assembling the cover member with the culture dish the lower end of the wall of the cover member is arranged in overlapping relationship with the upstanding wall 8 of the culture dish with the lower end of the wall 15 being disposed in the channel 9. In this connection, the lower end of the wall actually rests on the small projections 10 so that the frictional adherence between the base of the channel and the lower edge of the wall of the cover will be minimized thereby facilitating the removal of the cover.

When using the device, a suitable sealant may be applied to the channel or the lower edge of the cover wall, such as silicon resin or petroleum jelly.

It will be observed that the upstanding wall 8 and the base plate 7 of the culture dish form a receptacle for the culture medium. When my improved assembly is simply used in the conventional manner as a petri dish or culture dish, any of the known types of culture media may be employed in the culture dish. However, when it is used as a microorganism sampling device for checking surfaces for the presence, absence or identification of microorganisms, the culture medium should be relatively stiff and self-supporting as the upper surface of the culture medium should project above the level of the side walls of the culture dish as shown in FIG. 2. Thus, it will be seen that the rim 11 can be grasped in the hand of the laboratory technician or operator and the surface of the culture medium can be impressed against the surface which is being sampled.

In order to provide the desired culture medium, I may provide any base material of a gelatinous nature, such as agar or silica gel or gelatin. Suitable nutrient materials may be mixed therewith, such as meat infusion, beef serum, a carbohydrate such as dextrose or glucose and also other suitable materials such as peptone, proteose, potassium phosphate, thiamin, yeast extract and the like.

Examples of specific culture media which may be employed when my device is used as a microorganism sampling device are as follows:

Example I.—A culture medium of trypticase-soy agar is prepared and placed on the base plate 7 of the culture dish so as to project above the side walls as shown in FIG. 2. I have found that this culture medium is suitable for most aerobic bacteria.

Example II.—A culture medium of sabour and dextrose agar is prepared and placed on the base plate 7 of the culture dish so as to project above the level of the side walls of the dish as shown in FIG. 2. I have found that this culture medium is suitable for most yeasts and molds.

In using my device as a microorganism sampling device, I first fill the culture dish with a culture medium of the type indicated above and with the level of the culture medium extending above the upper edge of the upstanding wall 8, as most clearly indicated in FIG. 2 at 18. The cover member is applied thereto in the manner indicated so that the wall of the cover member is disposed in the supporting channel surrounding the culture dish. Thus, it will be seen that the top plate 14 of the cover member bridges over the upstanding wall 8 and the culture medium in the culture dish and is spaced thereabove. The covers may be held in place on the culture dish by means of a strip of adhesive tape or a plurality of dish and cover assemblies with the culture medium therein. The parts may be packaged together in a manner to retain the covers thereon. In sampling a particular surface, such as the walls of a hospital room on the bench or table in a sterile production room, the cover 6 is removed from the culture dish, the dish is grasped by the rim 11 and the culture medium is impressed against the surface to be sampled. Thereafter, the cover is applied thereto. The assembly may then be placed in a suitable thermal en-

vironment for the culturing of the microorganisms to be checked or tested. In this connection, the culturing may take place immediately, or the assembly in which the sample has been taken may be transported directly to the laboratory in which the culturing is to take place.

For most microorganisms a suitable thermal environment lies within the range of between 20° C. and 45° C. In the case of psychrophiles, the preferred temperature range is between 0° C. and 20° C., and, in the case of thermophiles, the preferred temperature range is between 45° C. and 70° C.

The assembled microorganisms sampling device which was used to take the sample is placed in a suitable thermal environment and permitted to remain therein for a suitable period of time for any microorganisms that might have been transferred from the sampled surface to propagate and multiply. For this purpose, a period of three to five hours is generally suitable. A visual inspection is then made as with a microscope and if microorganisms are detected they are identified and a count is made thereof. In this way a determination can be readily made as to whether the sampled surface was sterile or contaminated.

A suitable labeling or marking area may be provided on the cover member either by applying a gummed label thereto or preferably as shown by providing a friction surface as indicated at 17 by sand blasting or other suitable means. In this manner, the identity and location of the surface being sampled and the date of the sampling can be marked directly on the microorganism sampling device.

It will thus be seen that I have provided an improved microorganism sampling device and method in which the sampling can be taken directly from the surface to be checked without the necessity of an intermediate storage container and subsequent transfer to a culture medium. It will also be seen that my improved device may be used for culturing any type of microorganism and that it is simple to use with the result that it can be readily employed by laboratory technicians and nurses.

Modifications may be made in the illustrated and described embodiment of the invention without departing from the invention as set forth in the accompanying claims.

I claim:

1. A microorganism sampling device for testing a surface for the presence of microorganisms comprising a culture dish having a base plate formed with an upstanding wall extending continuously therearound adjacent the periphery thereof to provide a receptacle for culture medium and having cover supporting channel means surrounding and projecting outwardly from the upstanding wall, a relatively stiff self-supporting culture medium disposed in the receptacle of said dish and projecting to a level above said upstanding wall, and a cover member formed with a top plate and a continuous depending side wall, said side wall being so constructed and arranged with respect to the culture dish such that it has a size and configuration to surround and overlap the upstanding wall on the culture dish and rest in the supporting channel when the cover member is assembled with the culture dish, the said depending side wall of the cover member being of a greater height than the upstanding wall of the culture dish so that the top plate of the cover member bridges over and is spaced above the upstanding wall and the culture medium.

2. A microorganism sampling device for testing a surface for the presence of microorganisms comprising a culture dish having a base plate formed with an upstanding wall extending continuously therearound adjacent the periphery thereof to provide a receptacle for culture medium and having an upwardly facing outwardly projecting cover supporting channel surrounding the wall and a rim projecting downwardly from said channel to serve as a handle for grasping and manipulating said culture dish so that it can be impressed against a surface, a relatively stiff self-supporting culture medium disposed in the receptacle

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of said culture dish and projecting to a level above said upstanding wall and a cover member formed with a top plate and a continuous depending side wall, said side wall being so constructed and arranged with respect to the culture dish such that it has a size and configuration to surround and overlap the upstanding wall on the culture dish and rest in the supporting channel when the cover member is assembled with the culture dish, the said depending side wall of the cover member being of a greater height than the upstanding wall of the culture dish so that the top plate of the cover member bridges over and is spaced above the upstanding wall and the culture medium.

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