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VARIABLE ANGLE TUBE HOLDER

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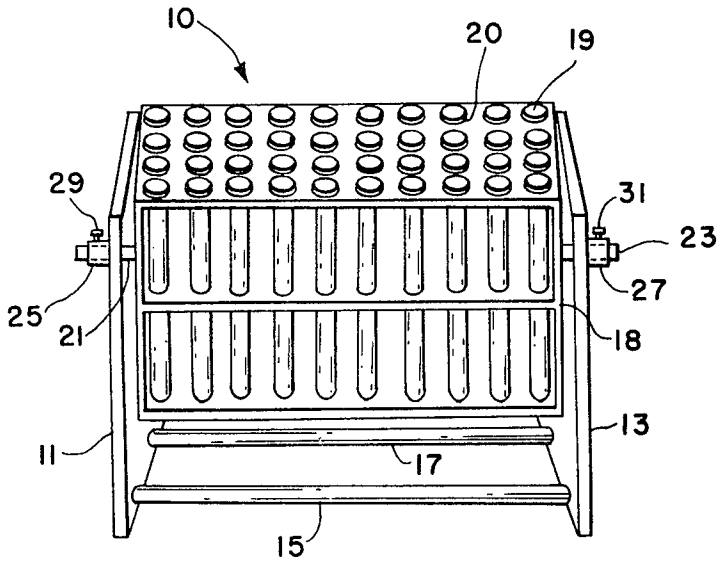


FIG. 1

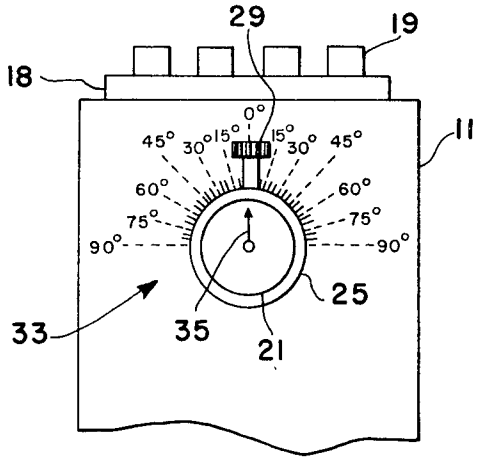


FIG. 2

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VARIABLE ANGLE TUBE HOLDER

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U.S. Cl. 195—127 2 Claims

ABSTRACT OF THE DISCLOSURE

A variable angle tube holder to enable laboratory personnel to make agar slants at any angle from the horizontal to the vertical.

ORIGIN OF THE INVENTION

This invention was made by an employee of the National Aeronautics and Space Administration and may be manufactured and used by or for the Government of the United States without the payment of any royalties thereon or therefor.

SPECIFICATION

In bacteriological laboratories it is common practice to culture bacteria on agar or other media slants in a test tube. These test tubes are partially filled with the agar or other media and placed in an autoclave or suitable oven for sterilization and then placed in a refrigerator at an angle for the media to solidify prior to inoculating with the bacteria. The angular position causes the media to solidify with an angular surface to thereby increase the usable surface area of the media. The particular angle at which the media is solidified may vary for different cultures and for that reason it is desirable that a suitable rack be provided during cooling of the sterile media that will produce different angular slants of the media. There is a commercially available rack for test tubes that is variable between 5° and 11° to the horizon but this rack is not suitable for autoclaving of the tubes and the tubes cannot be filled with agar while in this rack. There is thus a definite need in the art for a rack that may be varied from the vertical to the horizontal that will permit a number of test tubes to be filled with culture media, autoclaved and cooled to solidifying temperature with a minimum of handling of the tubes. The present invention fulfills this need.

Accordingly, it is an object of the present invention to provide a test tube holder that permits varying the tube angle from 0° to 90° with respect to the vertical.

Another object of the present invention is a variable angle test tube holder that permits positioning of a plurality of test tubes in a vertical position to facilitate filling of the tubes with culture media, and sterilization, and permits any desired angular positioning of the filled tubes during cooling.

Another object of the present invention is a test tube holder that can be used for filling the tubes with a culture media, holding the tubes during sterilization, and angular positioning the sterile tubes at any desired angle from 0° to 90° with respect to the vertical for cooling of the sterile media.

According to the present invention the foregoing and other objects are attained by providing a frame member including two vertical ends and at least one horizontal member secured to and maintaining the vertical ends in fixed spaced relationship. A test tube rack, capable of holding a plurality of test tubes, is suspended between the two ends of the frame in pivotal relationship therewith by an axle extending from the rack through each end member. A suitable thumb screw is provided on at least

one of the end members so as to engage the axle and hold the test tube rack at any desired angle between 0° and 90° with respect to the vertical end of the frame. Thus, the test tubes may be placed vertically in the tube holder for filling thereof with culture media and for sterilization. For cooling, the test tube rack may be placed at any desired angle to produce the slants desired.

A more complete appreciation of the invention and many of attendant advantages thereof will be better understood as the same becomes more apparent by reference to the following detailed description when considered in connection with the accompanying drawings, wherein:

FIG. 1 is a view of the variable angle tube holder of the present invention; and

FIG. 2 is an enlarged part end view of the variable angle tube holder shown in FIG. 1.

Referring more particularly to the drawings, FIG. 1 shows the variable angle tube holder of the present invention, as designated generally by reference numeral **10**. Tube holder **10** includes a frame composed of a pair of vertical end members **11** and **13** maintained in fixed spaced relationship by a pair of horizontal braces **15** and **17** rigidly secured thereto. A test tube rack **18**, capable of holding a plurality of test tubes **19** in openings **20**, formed therein, is pivotally secured to end members **11** and **13** by axles **21** and **23**. Each of end members **11** and **13** is provided with a transverse tubular receptacle, designated respectively by reference numerals **25** and **27**, and disposed about a suitable opening in the end members **11** and **13**. Axles **21** and **23** are fixedly attached to rack **18** and rotatably received by and extend through receptacles **25** and **27**. A suitable thumb screw, designated by reference numeral **29**, extends through receptable **25** and serves to lock axle **21** and the attached rack **18** at the desired angular position. An identical thumb screw **31** extends through receptacle **27** to engage axle **23** and also assist in locking rack **18** in the desired angular position.

Referring now to FIG. 2, it is seen that end member **11** and the end of receptacle **25** are provided with indicia thereon, as designated generally by reference numeral **33** to indicate different angular positions for rack **18**. A suitable pointer **35** is formed on the end of axle **21** to point to the angle that rack **18** is disposed with respect to the vertical end **11**. End member **13**, receptacle **27** and axle **23** are also provided with indicia and a pointer identical to that described for end **11** and not shown in the interest of brevity.

OPERATION

The operation of the invention is now believed apparent. Initially, tube holder **10** is positioned as shown in the drawings with thumb screws **29** and **31** serving to lock rack **18** in the vertical position shown. The desired number of test tubes **19** are then placed in openings **20** in rack **18**, filled with the desired culture media, and the entire holder assembly **10** placed in a suitable oven or autoclave for sterilization. After sterilizing, holder **10** is removed from the oven, thumb screws **29** and **31** loosened and rack **18** and attached axles **21** and **23** rotated to hte desired angular position as indicated by indicia **33**. Thumb screws **29** and **31** are then tightened to hold rack **18** at the selected angle and holder **10** and its contents are placed in a refrigerator to cool the culture media. After cooling, the culture media solidifies to thereby provide media slants on an angle corresponding to the angle at which rack **18** was placed for cooling.

It is thus seen that the present invention provides a test tube holder that permits filling, sterilization and cooling of culture media slants for any angle desired between 0° and 90° with respect to the vertical and in which handling of the test tubes by laboratory personnel is minimized. No

specific materials have been mentioned for forming the tube holder of the present invention, it being understood that any material capable of withstanding the sterilization temperature is considered within the scope of the present invention. Additionally, rack **18** may be formed of a welded wire mesh if so desired, braces **15** and **17** may be in one unitary piece and the described indicia may be located only on one end of holder **10** and may take a different form from that shown in the illustrative example. These and other modifications and variations will be readily apparent to those skilled in the art in the light of the above teachings.

It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. A variable angle tube holder adapted to receive a plurality of test tubes in a vertical position to facilitate filling of the test tubes with culture media and thereafter tilting said plurality of test tubes at any angle from 0° to 90° for subsequent sterilization, cooling and culturing the filled test tubes with a minimum of handling, comprising:

(1) a frame member including
  (a) two vertical end members and
  (b) at least one horizontal member secured to and maintaining said two end members in fixed spaced relationship,

(2) a rack supported by said frame member and including
  means in said rack for receiving a plurality of test tubes or the like,

(3) means securing said rack to said frame in pivotal relationship therewith,

(4) means for locking said rack at any angle from 0° to 90° with respect to the vertical end members of said frame,

(5) indicia on at least one of said end members and a pointer on said means securing said rack to said frame to point to the indicia indicating the angular relationship of said rack respective to said vertical end member, and,

(6) said tube holder being constructed of a lightweight material capable of withstanding sterilization temperatures when said holder and filled tubes are placed in a sterilization oven.

2. The variable angular tube holder of claim **1** wherein said means for securing said rack to said frame includes an identical opening in each of said end members with a fixed tubular receptacle secured in each said opening and an axle member secured to each end of said rack and rotatably received by each said tubular receptacle and said means for locking said rack includes a thumbscrew extending through at least one of said tubular receptacles so as to engage and impede rotation of said axles when said thumbscrew is tightened and to permit free rotation of said axles and attached rack when said thumbscrew is loosened.

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195—135, 140; 23—259