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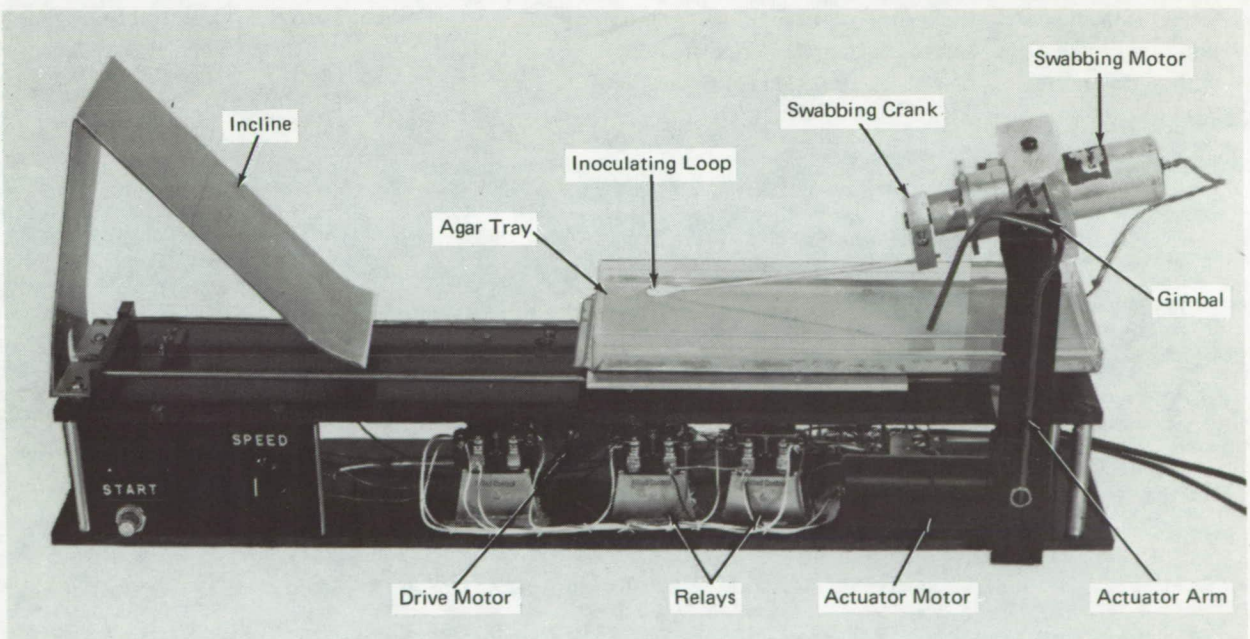
NASA TECH BRIEF

Langley Research Center

Automatic Agar Tray Inoculation Device

The automatic agar tray inoculation device, an instrument for the automatic inoculation of agar trays, is simple in design and fool-proof in operation. It employs either a conventional inoculating loop or a cotton swab for uniform inoculation of agar media, and it allows the technician to carry on with other activities while the tray is being inoculated. Trays containing combinations of selective or differential media can be used to (1) separate mixtures of bacteria, (2) facilitate isolation of microorganisms from clinical specimens, and (3) compare growth characteristics of pure cultures.



The device, as shown in the figure, consists of a motor-driven carriage which moves a plastic tray (7.6 x 23 cm, 3 x 9 in), which has dividers to separate the selective or differential media, past an inoculating loop or a cotton swab which inoculates the agar surface. The carriage is mounted on a double-rail track and attached to the carriage drive motor assembly by a cable. Carriage speed is controlled by adjustment of the rheostat; speeds range from 16.8 to 21.3 cm/min (6.6 to 8.4 in/min). The total length of travel is 23 centimeters.

The swabbing motor is mounted in a single gimbal with a swabbing crank attached to hold the inoculating loop or cotton swab. Pressure and angle of the loop or swab, relative to the agar surface, may be altered by moving the swabbing motor back and forth or up and down. The actuator motor lifts or lowers the inoculating loop or swab by means of the actuator arm.

The system is powered by a 15 volt dc power supply, but batteries may be substituted if such a requirement exists. Other electrical components are microswitches, relays, and one semi-conductor diode.

The inoculating loop or cotton swab to be processed is attached to the swabbing crank, and a tray containing

(continued overleaf)

the appropriate media is placed in the carriage. Power is applied through the start switch which activates the swabbing, drive, and actuator motors. The actuator arm lowers the loop to the agar surface, and as the tray moves forward, the loop which is in continuous contact with the agar surface inoculates the media by a combined 7.6 cm stroke from side to side plus a spiraling action along its longitudinal axis. The tray then proceeds up the 45° incline so that the trailing edge of the tray does not interfere with the streaking action. When the tray is completely inoculated a microswitch reverses tray direction and at the same time activates the actuator motor causing the actuator arm to raise the loop off the agar surface. After the carriage returns to its original position, a microswitch deactivates all motors. All operations are conducted inside a clear plastic box which is 38 cm (15 in) high, 30.5 cm (12 in) wide, 71 cm (28 in) long, and equipped with two ultraviolet lamps which are activated between tests.

The inoculation patterns for a loop and a cotton swab are distinctly different. In the case of a swab, the pattern consists of a brush-type effect caused by the almost continuous contact of the swab with the agar surface during the side to side streaking action. This type of inoculation results in a uniform distribution of cells from one end of the tray to the other. With the inoculating loop, however, the major portion of the cells is deposited on the agar surface during the initial streaking with a gradual release of cells as streaking continues the length of the tray. During the initial stages of streaking, as the flat side of the loop contacts the agar surface, the film inside the loop ruptures and releases the majority of cells. As the loop proceeds back across the agar surface the spiraling action allows the leading edge of the tip of the loop to remain in contact with the agar and release single cells or small clumps which result in isolated colonies.

Note:

Request for further information may be directed to:

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Patent status:

Inquiries concerning rights for the commercial use of this invention should be addressed to:

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