ELECTROSTATICS - Electric Fields

A sealed transparent acrylic container filled with suspended fibers fits on the overhead projector. Five special slides that are able to show different fields fit in the container on the overhead projector. A special piezoelectric pistol with an output of 5 kV is used to charge the slides. The fields that can be shown are:

1. parallel plate capacitator
2. a circle and a point
3. a pattern of two concentric circles that demonstrates electrostatic shielding
4. two like-charge points
5. two unlike-charge points
ELECTROSTATICS - Electric Fields

B-2154 ELECTROSTATIC FIELD EXPERIMENT APPARATUS, for OHP
Model: EF-5H

This apparatus is designed for projecting the electric line of force on OHP, generated by the electrified liquid and special powder which are sealed in a glass observation tank.

Construction:
* Observation Tank
  : Made of glass, with an air chamber.
  : The air is used for stirring the liquid in the tank.
  : Glass is so thin that it must be handled with care.

Caution
* Holder
  : To hold the observation tank which is inserted laterally.
  : Fix the tank with a stopper to prevent it from slipping off when tilted.

* Electrode Plate
  : To be set on the observation tank.
  : Do not press it down with force.

Caution
* Pistol as power source
  : To apply high voltage to the electrode plate.
  : Connect the black lead wire to the black terminal of the holder.
  : Let the metallic part at the muzzle touch the red terminal and pull the trigger.

How to Use
1. Attach the observation tank to the holder (insert it laterally with the air chamber upward). Set the stopper.

  * The observation tank should not be too clean.
  * Slight smear by a drop of oil is effective for static electricity.
ELECTROSTATICS - Electric Fields

2. Lay the holder on OHP. Tilt the holder so that the air bubble comes out of the air chamber for stirring liquid in the tank and goes back into the air chamber.
   **Caution**: Do not set the electrode plate during this operation.

3. Set the electrode plate in the position with electrode on the terminal side of holder.
   **Caution**: Do not press the electrode plate forcefully on the observation tank.

4. Adjust the focus of OHP.

5. Connect the earth lead wire of the pistol (Black) to one of the terminals of the holder (Black).

6. Bring the muzzle of the pistol into contact with the other terminal of the holder (Red). Pull the trigger slowly watching the phenomenon in the tank. When clear electric line of force is produced, stop triggering and take the pistol away from the terminal. In the more distance, release the trigger.
   * Pistol generates + (positive) electricity when its trigger is pulled, and - (negative) electricity when released. Clear lines can be obtained after trial and error. In case of failure to produce clear lines, change the connection of lead wire such that black lead wire be connected to the red terminal of the holder.

7. When replacing the electrodes or making a new electric line of force, be sure to remove the electrode plate and to stir the liquid with the air bubble each time.

8. In the case of unsatisfactory results because a humidity and other factors, wipe both glasses of the tank with a drop of oil.

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<th>Desirable conditions to obtain good results are:</th>
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<tr>
<td>1. The observation tank is not charged with electricity.</td>
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<td>2. The observation tank is well insulated.</td>
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Electrode Plate
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- Holder
- Observation Tank
- Pistol as power source