

LOW COST DISCHARGE ELECTRODE

TECHNOLOGY OVERVIEW



The Discharge Electrode is a critical component of Electrostatic Precipitators (ESP) and air-filters. Researchers have devised a low-cost alternative that meets the growing market demand for such a device. The prototype is a two-piece assembly consisting of a cylindrical rod (made from an inexpensive, not necessarily conductive material) on which sharp discharge pins are mounted and is wrapped by a conductive spike-carrying material (made from good quality material to provide environmental resilience). It is cost-effective in comparison to available one-piece electrodes that are fabricated from a single expensive material. As an example, the adjoining figure shows a mace electrode that has been fabricated using metallic spikes wrapped around a hollow PVC cylindrical pipe. The device can have unlimited configurations, being highly flexible in design parameters, physical dimensions and materials.

POTENTIAL FIELDS OF USE

The technology has strong potential applications in energy production, ESP and air-purifier manufacturing. The Department of Energy (DOE) guidelines for coal-fired power plants require significant reduction in emissions of particulate matter and other toxic by-products. The electrodes can help achieve these goals by controlling emission in exhaust stacks. With nearly 540 U.S. coal-burning plants using ESPs, the devised technology has lucrative commercial prospects. ESP components form a \$1.5 billion world-wide market aided by huge international investments. U.S., India and China plan on constructing 850 coal power-plants in the next four years.

BENEFIT ANALYSIS

The proposed technology provides a number of key benefits over existing models:

- Inexpensive and efficient production feasible by reducing the amount of alloy used. This is facilitated by fabricating the device using multiple sub-components instead of a solid metal construction.
- Lower manufacturing cost, facilitated by using ten times lower cost polymers and other similar materials.
- Lower installation costs enabled by its light-weight design that reduces structural support requirements.
- Flexibility in design parameters permits variation in the pitch and length of the spikes.

STAGE OF DEVELOPMENT

The proposed technology is at an early conceptual stage and requires further research and testing to develop a marketable device. It needs improvement to meet manufacturing requirements. Multiple configuration prototypes of the device have been constructed and successfully tested in the laboratory.

FUTURE DEVELOPMENT

Actual application testing is required to confirm the cost and performance evaluation of the devised prototype in comparison to the existing conventional technology. Research is needed to identify suitable low-cost materials, manufacturing and installation options.

LICENSING OPPORTUNITIES

A patent for the technology is pending. Licensing opportunities are available.

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