# WIDE RANGE FABRICATION OF NANOFIBRE-WEBS FOR PEST-CONTROL AND EXTENDED LIFE OF FARM PRODUCE-SYSTEM, APPARATUS AND METHODS

## IITM Technology Available for Licensing

### Problem Statement

- Conventional electrospinning setups are bulky and fixed, limiting their application to specific locations and substrates, particularly non-conducting surfaces like farm produce
- Existing portable electrospinning apparatuses lack safety measures and control over fiber deposition, especially over large areas, due to the influence of environmental factors like air currents and humidity.
- Current methods of preserving farm produce involve pesticides that can render them unsafe for consumption, leading to toxicity concerns.
- There's a need for **an electro-spinnable solution that can coat large areas** safely and economically while addressing the limitations of existing electrospinning technologies.

### Intellectual Property

- IITM IDF Ref. **1187**
- **IN 372442 - Patent Granted**

### Technology Category/ Market

**Category- Advance Material & Manufacturing**
**Applications**- Biomedical Engineering, Packaging, Agriculture and Crop Protection
**Industry-** Advanced Materials and Manufacturing, Biomedical and Healthcare, Packaging and Consumer Goods
**Market-** Nanofiber Electrospinning Equipment Market to surpass $1.19 Billion by 2030, growing at a **CAGR of 15.2%.**

### TRL (Technology Readiness Level)

**TRL - 3, Proof of concept stage**

### Research Lab

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### Technology

**The invention introduces an electrospinning apparatus designed for depositing nanofiber webs onto both conducting and non-conducting surfaces.**

**The apparatus includes essential components such as pumping units, a primary reservoir for electro-spinnable solutions, a spinneret with nozzles, and a power source providing intermittent positive voltage pulses. (refer Fig. 1)**

**The method involves utilizing this apparatus to transform electro-spinnable solution droplets into Taylor cones, generating jets of nanofibers directed at the desired surfaces for deposition.**

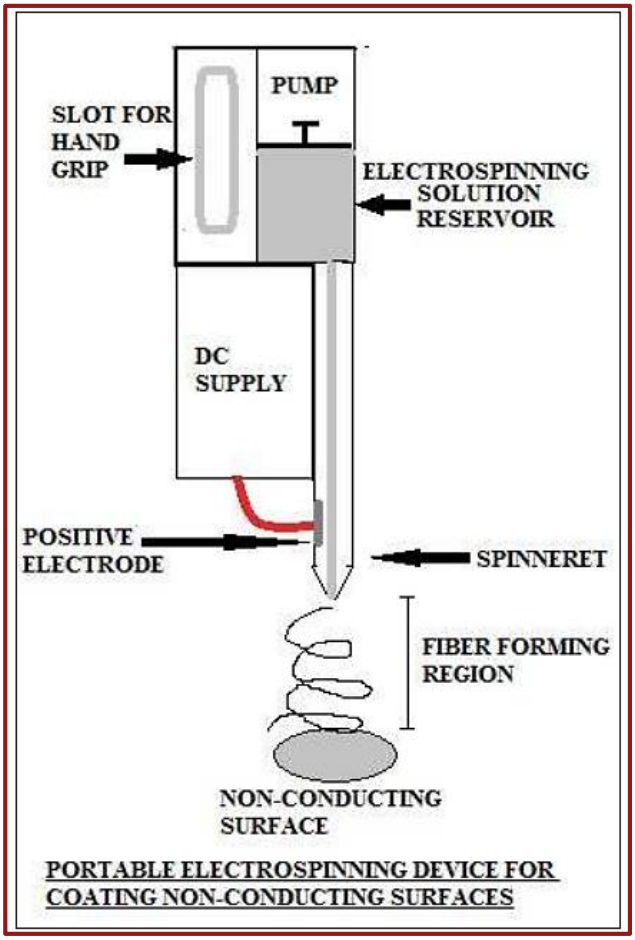


**Fig.1. A portable electrospinning apparatus for coating nonconducting surfaces.**

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## Key Features / Value Proposition

**1. Enhanced Versatility:**
Provides deposition of nanofiber webs on both conducting and non-conducting surfaces, expanding application possibilities.

**2. Precision Deposition:**
Offers controlled manipulation for precise deposition patterns, ensuring targeted coverage.

**3. Scalability and Adaptability:**
Can be coupled with battery-operated power sources or oscillating brackets for versatile deployment in various settings.

**4. Thickness Control:**
Enables precise control over nanofiber web thickness, ranging from 0.05 μm to 200 μm, catering to diverse needs.

**5. Pest Prevention for Farm Produce:**
Addresses agricultural challenges by preventing pest attacks on farm produce through nanofiber deposition.

**6. Improved Safety and Efficiency:**
Enhances safety and efficiency by automating or semi-automating manipulation processes, reducing manual intervention.

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