

पेटेंट कार्यालय
शासकीय जर्नल

**OFFICIAL JOURNAL
OF
THE PATENT OFFICE**

निर्गमन सं. 24/2025
ISSUE NO. 24/2025

शुक्रवार
FRIDAY

दिनांक: 13/06/2025
DATE: 13/06/2025

पेटेंट कार्यालय का एक प्रकाशन
PUBLICATION OF THE PATENT OFFICE

INTRODUCTION

In view of the recent amendment made in the Patents Act, 1970 by the Patents (Amendment) Act, 2005 effective from 01st January 2005, the Official Journal of The Patent Office is required to be published under the Statute. This Journal is being published on weekly basis on every Friday covering the various proceedings on Patents as required according to the provision of Section 145 of the Patents Act 1970. All the enquiries on this Official Journal and other information as required by the public should be addressed to the Controller General of Patents, Designs & Trade Marks. Suggestions and comments are requested from all quarters so that the content can be enriched.

**(PROF. (DR) UNNAT P. PANDIT)
CONTROLLER GENERAL OF PATENTS, DESIGNS & TRADE MARKS**

13th June, 2025

(54) Title of the invention : PORTABLE SOIL MICRO BIOME ANALYZER (PSMA) WITH AI-BASED INTERPRETATION AND WIRELESS CONNECTIVITY

(51) International classification :C12Q0001686900, G06N0020000000, C12Q0001680600, B01L0003000000, C12N0015100000

(86) International Application No :NA
Filing Date :NA

(87) International Publication No : NA

(61) Patent of Addition to Application Number :NA
Filing Date :NA

(62) Divisional to Application Number :NA
Filing Date :NA

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(57) Abstract :
The present invention provides a portable soil micro biome analyzer (PSMA) with AI-based interpretation and wireless connectivity. The device automates sample processing and nucleic acid extraction via a miniaturized microfluidic system, eliminating the need for laboratory infrastructure. Nanopore sequencing provides real-time, long-read DNA data, while cloud-based machine learning models identify microbes, predict functional traits, and generate actionable microbiome insights. Results are transmitted wirelessly to smartphones or servers, supporting integration with precision agriculture, ecological monitoring, and research networks. Rugged, battery-powered, and user-friendly, the analyzer is suitable for use in remote environments by non-experts. This innovation democratizes soil microbiome analysis, enabling timely, data-driven decisions for sustainable agriculture, environmental monitoring, and soil health management, effectively bridging the lab-to-field gap in microbial genomics.

No. of Pages : 29 No. of Claims : 8