पेटेंट कार्यालय
शासकीय जर्नल

OFFICIAL JOURNAL
OF
THE PATENT OFFICE

निर्गमन सं. 02/2025	शुक्रवार	दिनांक: 10/01/2025
ISSUE NO. 02/2025	FRIDAY	DATE: 10/01/2025

पेटेंट कार्यालय का एक प्रकाशन
PUBLICATION OF THE PATENT OFFICE

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :23/12/2024

(21) Application No.202441102048 A
(43) Publication Date : 10/01/2025

(54) Title of the invention : SMART WASTE ML-DRIVEN CLASSIFICATION FOR EFFICIENT ORGANIC AND NON-ORGANIC MANAGEMENT

(51) International classification	:G06N0020000000, G06Q0010300000, G06T0007000000, G06N0003044000, B65F0001140000
(86) International Application No Filing Date	:NA :NA
(87) International Publication No	: NA
(61) Patent of Addition to Application Number Filing Date	:NA :NA
(62) Divisional to Application Number Filing Date	:NA :NA

(71)**Name of Applicant :**
1)Dr. Pravina Baburao Piste Professor, Dept. of Chemistry, RCSC
Address of Applicant :Rajarshi Chhatrapati Shahu College, Kolhapur, Vichare Mal, Kadamwadi Road, Sadar bazar, Kolhapur -416003 India. ---------- ----------
2)Dr. Umesh Suresh Shelke Associate Professor, Dept. of Chemistry, RCSC
3)Dr. Shakil Dilawar Shaikh Asst. Professor, Dept. of Botany, RCSC
4)Mr. Shubham Dilip Shedge Asst. Professor, Dept. of Mathematics, RCSC
Name of Applicant : NA
Address of Applicant : NA
(72)**Name of Inventor :**
1)Dr. Pravina Baburao Piste Professor, Dept. of Chemistry, RCSC
Address of Applicant :Rajarshi Chhatrapati Shahu College, Kolhapur, Vichare Mal, Kadamwadi Road, Sadar bazar, Kolhapur -416003 India. ---------- ----------
2)Dr. Umesh Suresh Shelke Associate Professor, Dept. of Chemistry, RCSC
Address of Applicant :Rajarshi Chhatrapati Shahu College, Kolhapur, Vichare Mal, Kadamwadi Road, Sadar bazar, Kolhapur -416003 India. ---------- ----------
3)Dr. Shakil Dilawar Shaikh Asst. Professor, Dept. of Botany, RCSC
Address of Applicant :Rajarshi Chhatrapati Shahu College, Kolhapur, Vichare Mal, Kadamwadi Road, Sadar bazar, Kolhapur -416003 India. ---------- ----------
4)Mr. Shubham Dilip Shedge Asst. Professor, Dept. of Mathematics, RCSC
Address of Applicant :Rajarshi Chhatrapati Shahu College, Kolhapur, Vichare Mal, Kadamwadi Road, Sadar bazar, Kolhapur -416003 India. ---------- ----------

(57) Abstract :
This invention introduces a machine learning (ML)-driven waste classification system that efficiently distinguishes between organic and non-organic waste materials to improve waste management processes. Leveraging a combination of sensors, cameras, and a deep learning model trained on extensive datasets, the system analyses waste items in real time, achieving high accuracy in classification. Waste materials are transported through the system on a conveyor where sensors, including infrared and spectral imaging, capture data on each item's composition and physical attributes. This data is then processed by the ML model, which has been trained to recognize patterns unique to organic and non-organic materials. The classification results direct each item to its respective bin or processing line, allowing organic waste to be channelled for composting and non-organic waste for recycling or disposal. By employing adaptive learning, the system continually improves its accuracy by adjusting to any changes in waste types and composition, making it suitable for diverse and variable environments. A feedback loop is incorporated, allowing the system to log misclassifications and adjust its algorithms for future processing, thus maintaining a high standard of sorting precision over time. Additionally, the modular nature of the system makes it compatible with both large, centralized facilities and smaller, decentralized setups, enabling localized waste sorting and reducing transportation requirements. This reduces carbon emissions associated with waste transport, supporting a more sustainable, circular economy model. The ML-driven system not only reduces manual labour and associated costs but also improves the purity of waste streams, enhancing the quality of recyclable and compostable outputs. This innovation represents a significant advancement in waste management technology, promoting environmental sustainability by increasing recycling rates, reducing landfill use, and lowering contamination in organic waste streams.

No. of Pages : 11 No. of Claims : 5