

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202511095649 A

(19) INDIA

(22) Date of filing of Application :06/10/2025

(43) Publication Date : 05/12/2025

(54) Title of the invention : AN AUTOMATED CELL CULTURE SYSTEM FOR HIGH-THROUGHPUT BIOTECH APPLICATIONS

(51) International classification	:C12M0001000000, C12M0001360000, C12M0001340000, C12M0001120000, C12M0003000000	(71) Name of Applicant : 1)NOIDA INSTITUTE OF ENGINEERING & TECHNOLOGY Address of Applicant :19, Knowledge Park-II, Institutional Area, Greater Noida – 201306, Uttar Pradesh, India. Uttar Pradesh India
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(86) International Application No	:	
Filing Date	:01/01/1900	
(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	

(57) Abstract :

The invention discloses an automated cell culture system designed for high-throughput biotechnology applications. It comprises a robotic arm (1) for precise handling, an incubator chamber (2), a nutrient supply unit (3), a sensor module (4), an AI control unit (5), and a waste management system (6). The integrated system ensures reproducibility, contamination resistance, scalability, and real-time optimization of growth conditions. Experimental validation demonstrated superior reproducibility, reduced contamination, and increased efficiency compared to manual methods, making the system highly suitable for pharmaceutical, research, and industrial bioprocess applications.

No. of Pages : 14 No. of Claims : 6