Public Relations Office
Jamia Millia Islamia

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Press Release

Government of India grants patent to JMI Professor's ground breaking invention to check the purity of materials

Jamia Millia Islamia (JMI) is pleased to announce that Professor Munna Khan from the Department of Electrical Engineering and his team has been granted a patent by the Government of India for their ground-breaking invention entitled "METHOD AND APPARATUS FOR ANALYTICAL CHARACTERIZATION AND IDENTIFICATION OF MATERIALS", a device that will be very useful particularly for the healthcare industry. The developed medical device can efficiently check the purity of materials in the form of solid, fluid, and powder.

Prof. Mohammad Shakeel, Officiating Vice Chancellor, JMI, congratulated Prof. Khan for the achievement and wished him success for his future endeavors.

Intellectual property law plays a crucial role in the healthcare industry, where innovation is the driving force behind improved healthcare. Healthcare related patents have become increasingly popular because of more personalized devices.

This is the 6th patent granted to Prof. Munna Khan, a leading innovator in the field of healthcare. The granted patent is a testament to the hard work and dedication of Professor Khan and his team: Dr. Kashif I.K. Sherwani, Dr Md Qaiser Reza, Dr Shaila P.S.M.A. Sirdeshmukh, and Dr Ashok Kumar Salhan, Department of Electrical Engineering, JMI and Dr Ashok Kumar Salhan, Scientist G superannuated from Defence Institute of Physiology and Sciences (DIPAS), DRDO, Govt. of India.

Newly granted patent covers the invention used for analytical characterization and identification of materials in four states e.g. solid, liquid, fluid, and powder. The method comprises generating forced vibration into each identified material using acoustic resonator assembly and then records acoustic signals. The acoustic resonator assembly is formed by a V-shaped solid quartz strip with two attached piezoelectric transducers, signal generator, preamplifier, signal pre-processing unit, and data analysis and classification unit. The distinguishing resonance features are extracted from a spectrum of recorded signals and used to check purity on the basis of analytical characterization for materials. Based on extracted features of reference materials, a device was developed for analytical comparison with an unknown material.

The traditional methods for analytical characterization and identification of materials involve techniques like chromatography, NIR, laser emission, and others have several drawbacks and limitations like large investment cost, complex instrumentation, exposure to harmful radiation,

and also require material sample preparation. Embodiment of the present invention overcomes the disadvantage and limitations of the prior art by providing a method and apparatus based on a machine learning model for analytical characterization and identification of materials. It is simple, cost effective, free from harmful radiation, easy to handle, and no material sample preparation is needed.

Earlier patents granted to Prof. Munna Khan are as follows:

1. Patent No. 534483 granted on 23 April 2024 for an invention entitled “APPARATUS AND METHOD FOR WOUND HEALING”.

2. Patent No. 531804 granted on 04 April 2024 for an invention entitled “THERAPEUTIC APPARATUS FOR POSTURE AND BALANCE”

3. Patent No. 514990 granted on 26 Feb 2024 for an invention entitled “FORCE MEASUREMENT SYSTEM FOR MASTICATORY MUSCLES”.

4. Patent No. 490588 granted on 28 Dec 2023 for an invention entitled, “PORTABLE COTTON BALL PLUCKING DEVICE”.

5. Patent granted on 20 Jan 2023 with certification of the design No. 347066-001 dated 31/ 07/2021 by registering in class 24-01 in respect of IMPEDANCE ANALYSER-CP 25. [In pursuance of and subject to the provisions of the Designs Act, 2000 and the Designs Rules, 2001].

The granting of these patents not only underscores the novelty and technical strength of the developed devices but also enhances JMI’s intellectual property portfolio, providing significant competitive advantages in the marketplace. JMI looks forward to leveraging the technologies of these patents for commercialization by transferring technologies to the industries.

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Professor Munna Khan