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(54) Title of the invention : INTEGRATED SMART MRI SAFETY GATE SYSTEM FOR REAL-TIME DETECTION OF FERROMAGNETIC MATERIALS AND AUTOMATED IDENTIFICATION OF IMPLANT COMPATIBILITY

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(57) Abstract :

The present invention relates to an integrated smart MRI safety gate system designed to enhance pre-screening accuracy and patient safety before entering a Magnetic Resonance Imaging environment. The system combines a ferromagnetic detector array for identifying external and internal metallic objects, an RFID/NFC implant reader for retrieving implant-specific safety data, an implant safety verification engine for cross-referencing detected implants with standardized MRI safety databases, and a technologist interface panel for real-time safety visualization. An adaptive MRI protocol generator provides tailored scan modifications for MR Conditional implants, while a clearance generator produces time-stamped digital or printed screening records. By unifying detection, identification, verification, and clearance within a single automated workflow, the invention reduces human error, accelerates patient throughput, and establishes a reliable framework for standardized MRI safety practices. Accompanied Drawing [FIGS. 1-2]

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