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(31) Priority Document No	:NA	(72)Name of Inventor : 1)Mr. Kamal Preet Singh
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(57) Abstract :

A real-time vehicle compliance system comprises an Identification and Detection Module that captures a unique vehicle identifier using sensor-based identification, a Real-Time Compliance Evaluation Layer that aggregates regulatory data from multiple sources to generate a continuously updated composite compliance score, and a Risk-Based Decision Engine that applies weighted probabilistic and fuzzy logic models to compute a risk score for determining full, conditional, or denied service access. The Service Control and Authorization Unit translates this outcome into control signals for regulated mechanisms such as fuel dispensers, charging stations, or access gates, while an optional Recording and Notification Module logs the evaluation data for oversight. The invention provides a modular, technology-agnostic integration architecture enabling independent or coordinated operation of its components for enhanced real-time vehicle compliance verification.

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