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IoT based LPG Gas Cylinder Trolley to Prevent Hazards with Voice Controlled Features

Mhaske Pratiksha Suresh, Rathod Snehal Sohanlal, Pokale Sweta Vilas, Prof. S. S. Gite

Department of E&TC Engineering Amrutvahini College of Engineering, Sangamner, A.Nagar, India

Abstract: The LPG gas cylinder trolley system integrates advanced safety features to detect and mitigate potential hazards like gas leaks and fire risks, ensuring a secure environment for users. At its core, the system utilizes a PIC18F4520 microcontroller that processes inputs from various sensors, including an LPG gas sensor, fire sensor, and load cell, to monitor gas leaks, fire conditions, and the weight of the gas cylinder. When a hazardous situation is detected, the microcontroller triggers safety measures, such as activating an exhaust fan to disperse gas and shutting off the cylinder valve to prevent further leakage. Real-time status updates are displayed on an LCD screen, while a buzzer provides an audible alarm for immediate attention. Additionally, the system features Bluetooth and GSM modules for remote control and alerts, enabling users to monitor and manage the system from a distance via voice commands or SMS notifications. The system is powered by a stable 12V battery, with a 7805 voltage regulator ensuring consistent 5V supply to critical components. The overall design incorporates essential protection features, including diodes, transistors, and capacitors, to safeguard the circuit from overcurrent and voltage fluctuations. The modularity of the system allows for future upgrades, such as adding more sensors, to enhance its capabilities further. This comprehensive safety mechanism not only prevents accidents but also offers a user-friendly interface for easy interaction and control.

Keywords: LPG gas cylinder, microcontroller, safety system, Bluetooth module, fire sensor



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