Gas Leakage Detection and Control System for Homeuse Gas Cylinders

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Costa Rica experiences a high incidence of emergencies caused by gas leaks; 4700 events in total were reported in the year 2015 alone. Some of the factors that contribute to worsen the problem are the lack of regulations for handling and caring for the cylinders, as well as for the installation at the end-user’s location. Due to this situation, this project focuses on mitigating accidents caused by gas leaks, through the creation of an integrated detection, flow-control and event communication system. The system works by detecting any possible gas leak and addressing the different issues that could result in an explosion. Specifically, this device shuts the electrovalve that conducts the gas to the stove, extracts the gas from the environment, disconnects the power to prevent it from being a source of ignition, generates an audible and visible signal, and sends both a text message and a telephone call to the user and the emergency responders. Additionally, the device reports the amount of gas left in the cylinder; such information is very useful in order to program safe facilities with a supplier. The assessment of the device showed high precision in leak detection with a response time of 3 to 4 seconds. SMS and telephone call communications occurred within 20 and 38 seconds. The designed system successfully satisfied the proposed objectives. The use of proper equipment is recommended when installing gas for home-use. A device of this type would be very important to reduce the large number of emergencies, preventing not only the loss of lives but also minimizing the high cost of this sort of event

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