Smart Blind Stick for Visually Impaired Person

Vision plays a vital role in helping humans interact with their surroundings, but it can be lost due to accidents or untreated eye diseases, leading to permanent blindness. According to the World Health Organization (WHO), about 236 million people worldwide are visually impaired, including nearly 37 million who are blind or have severe to moderate vision impairment. This project presents an advanced intelligent blind stick designed to improve the safety, mobility, and independence of visually impaired individuals. The system is built around a PIC microcontroller and integrates ultrasonic sensors for obstacle and step detection, along with water, fire, and LDR sensors to identify environmental hazards. Voice alerts through a headset and buzzer notifications provide real-time guidance to the user. A fall detection mechanism is incorporated to identify accidental falls and trigger emergency alerts. For enhanced safety and connectivity, a GSM module with mobile application support is included, along with an SOS button that sends emergency messages with live GPS location to predefined contacts. To ensure sustainability and longer operation, a solar panel is integrated to recharge the battery. The entire system is programmed using embedded C language, offering a low-cost, reliable, and eco-friendly assistive solution for visually impaired people.

Features of this project:

- Ultrasonic sensor based obstacle detection and voice alerting system.
- Steps detection and alerting.
- LDR based automatic light control.
- Water sensor based voice alerting system.
- Fire detection and alerting through Buzzer.
- Design a voice assist for blind person.
- Audible alerts using Buzzer.
- To achieve this task using PIC Microcontroller.

The major building blocks of this project are:

- Regulated Power Supply.
- PIC Microcontroller.
- Ultrasonic Sensors.
- Moisture Sensor.
- Fire sensor.
- Buzzer.
- Headset.
- LDR.
- LED Lamp.
- KY-027.
- Solar Panel.
- GSM.
- Emergency Button.
- Reset Button.
- Crystal oscillator.
- LED indicators.

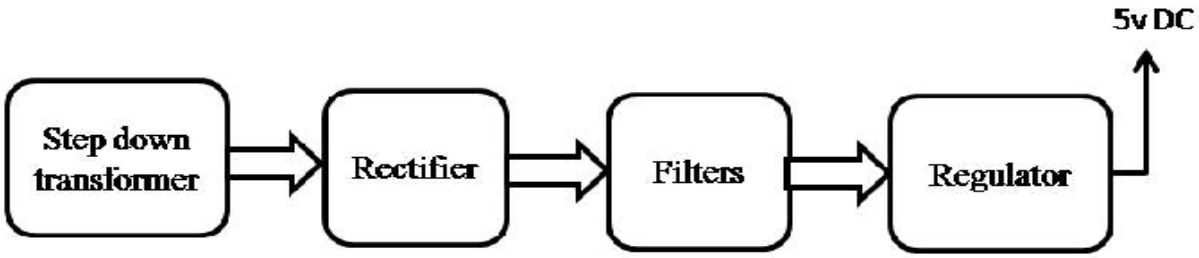
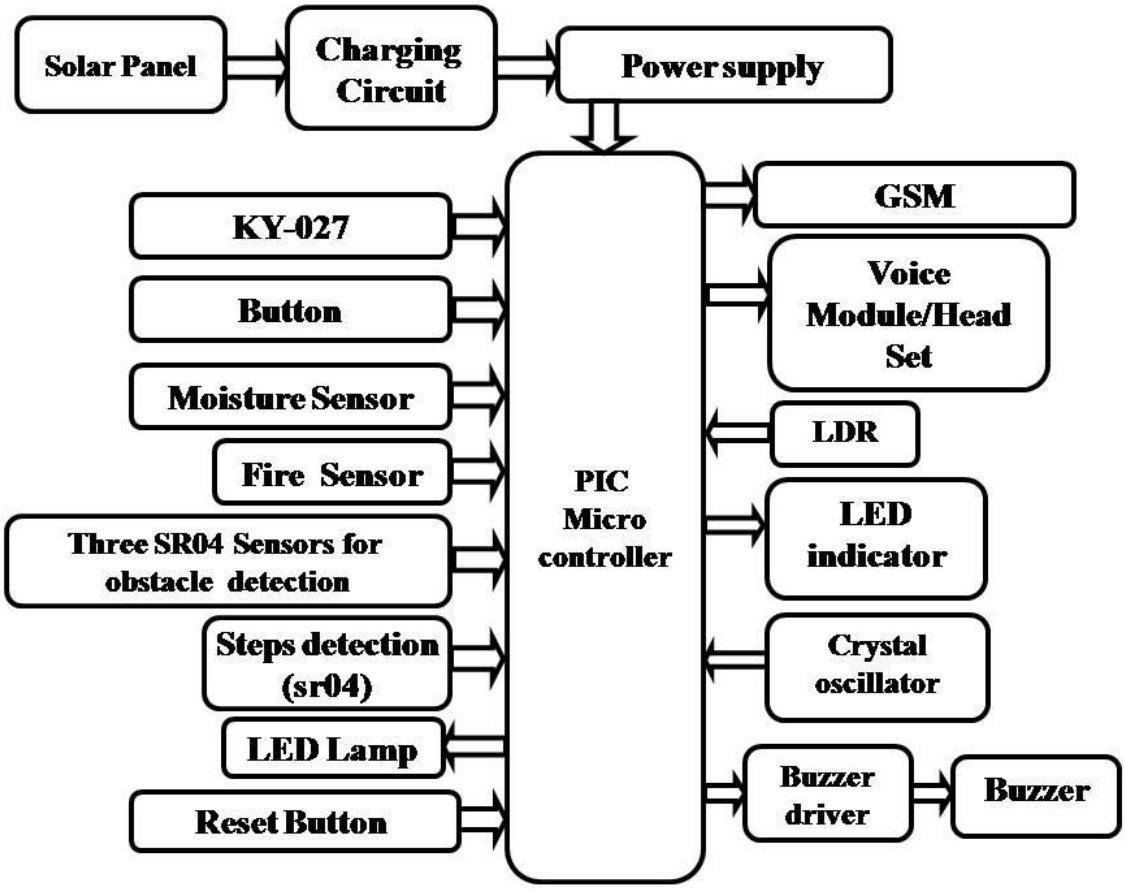
Software's used:

1.PIC-C compiler for Embedded C programming.

2.PIC kit 2 programmer for dumping code into Micro controller.

3. Express SCH for Circuit design.

Regulated Power Supply:



BLOCK DIAGRAM: