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360 DEGREE FIRE PROTECTION ROBOT

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Abstract

A fire fighter's work entails detecting and extinguishing fires. In this rapidly evolving technological age, the world is gradually moving toward automated systems. Fire fighters, on the other hand, are often in danger of losingtheir lives. The majority of the deaths were caused by toxic gases found in the fire fighting environment. As a result, in order to resolve these issues, our system was developed.Yes, the idea behind is really commendable. It can be deployed in areas where human access is not possible like nuclear reactors, for military applications, as unmanned guide vehicles for spy operations, mine diffuser, bomb detector etc. Here our project is controlled by Bluetooth using android to detect the fire and to prevent all from fire. It will be regulated by self-controllerand hence it will be a 360' protection system from fire.Fire monitors and sprayers are an amiable and controllable high-capacity water jet used to deal with large fires. Unlike Fire extinguishers, Fire Monitors are permanently installed and cannot be moved. While traditional fire monitors systems need a on-vehicle human operator to change the direction of the water jet and aim it appropriately but our model will be controlled wirelessly and can be operated from a distant place so that no harm can be occurred during fire extinguishing.

Introduction

Nowadays, machinery and robotic design become important in helping human. This Fire Protection Robot was design to help people in any destructive burnt situation where this robot can extinguish burnt area immediately using autonomous system. In real life, destructive burnt area often happens without our realization. Therefore, this type of robot will require a high demand in the marketbecause of its usefulness to the human as well as the environment transmit fire information to cell phone using controller. The objective of the project will be to design a SMS electronic Fire Protection Robot toolkit which can replace the traditional Fire Protection Robot. The toolkit sends the fire and send SMS to owner of the house, the system is made efficient by SIMs so that the SMS can be received by number of devices boards in a locality using techniques of time division multiple access.

Literature survey

S. Kumar [1] Robots have become out to be an aspect wherein many human beings have shown their interest and gained reputation due to the development of many technologies. Consequently, it has been decided to design something that may make human existence less difficult and more cozy, and the interest of this assessment is to make a "far flung managed 360 degree fireplace protection device." The proposed "faraway controlled 360 diploma fire safety machine" is designed for extinguishing hearth in a small floor plan of a residence, workplace, or shopping mall of precise dimensions with the help of family water and a water pump. Controlling this robotic demands an operator who can easily manage it from a faraway area without being concerned in firefighting.

M Raham [2]Fire monitors and sprayers are an amiable and controllable high-capacity water jet used to deal with large fires. Unlike Fire extinguishers, Fire Monitors are permanently installed and cannot be moved. While traditional fire monitors systems need a human operator to change the direction of the water jet and aim it appropriately, this fire monitor has been equipped with RF control. Thereby allowing the user to operate it from a safe distance.

S Panat[3] Fire hazards are a common phenomenon in developing countries like India causing loss of lives and property every year. Fire emergencies occur where either a human cannot reach on time or location of fire is hazardous and life threatening for humans to approach and douse the fire. The Design and development of a Fire Fighting Robot will provide an impactful solution for society and help save lives.

D kandu [4] The firefighting occupation has a long history of dangerous situations. There has been numerous and devastating human losses because of lack in technological advancements. In daily life, fire hazards have become more common and it becomes the responsibility of fire fighters to overcome any difficulties and extinguish fires protecting the human life and other possible losses. But they are often exposed to higher risks while performing fire extinguishing operations, especially in hazardous environments such as in nuclear power plants and petroleum refineries. With the development in the field of robotics, human intrusion have become less and robots are being widely used in order to overcome difficulties faced by firemen. This is one of the reasons for which robots are used instead of humans to handle fire hazards. Therefore, this paper presents the development of a firefighting robot that can extinguish fire without the need for fire fighters to be exposed to unnecessary danger. In this project, we are developing a robot which can also be used on domestic levels for fire extinguishing operations. This robot is compact in size and can be used to extinguish fires reaching the impacted areas through narrow pathways.

S. Geol [5] The role of automation industry to solve real life problems is increasing day- by-day. In some kind of emergency situations like fire control in a building, it is so difficult for a human being to go inside the fire to extinguish it. So, in future aspects there is a need to build some special robots/machines having better heat resistant properties under high temperature conditions. The robot should automatically detect the fire with the help of temperature sensors which are mounted on the robot‘s surface and to take quick action to extinguish the fire. Another most important feature is required in the firefighting robot should be connected to the control room with the help of wireless connection.

Methodology

The features were pondered by the researchers technically focusing on the components contributions when assembled as one robot. The Design and Fabrication of Fire Fighting Autonomous Robotic System Equipped with Sensitive Sensors for Fire Alarm and Detection, Avoidance Behavior Mechanism and SMS Messaging Capability has additional features that make it unique to others.

It was installed with an alarm system that notifies the owner that flame has occurred. Moreover, it has an auxiliary function like ultrasonic sensor, flame sensor and a smoke sensor that detects the flame combustion. Robot is a machine that resembles a human being and mimics various complex tasks. Now, let us have a good look at existing firefighting robots. The following robots below are the characteristic of the previous robot that have been similar with this robot project and used in the literature reviews.

There are three types of electrical connections between the stator and rotor possible for DC electric motors: series, shunt/parallel and compound (various blends of series and shunt/parallel) and each has unique speed/torque characteristics appropriate for different loading torque profiles/signatures.A series DC motor connects the armature and field windings in series with a common D.C. power source. This motor has nonlinear speed regulation since its speed varies in a non-linear function of load torque (i.e. current); current is common to both the stator and rotor yielding I^2 (current) squared behavior. However, a series DC motor has very high starting torque and is commonly used for starting high inertia loads, such as trains, elevators or hoists. With no mechanical load on the series motor, the current is low, the magnetic field (BEMF or counter-EMF) produced by the field winding is weak, and so the armature must turn faster to produce sufficient counter-EMF to balance the supply voltage (otherwise current increases and the motor can be distorted/ burned -- i.e. the coils without relative motion appear as a short circuit). The motor may increase its speed until the motor mechanically destroys itself. This is called a runaway condition. The speed/torque characteristic must match the applications such as dragline excavators, where the digging tool moves rapidly when unloaded but slowly when carrying a heavy load.

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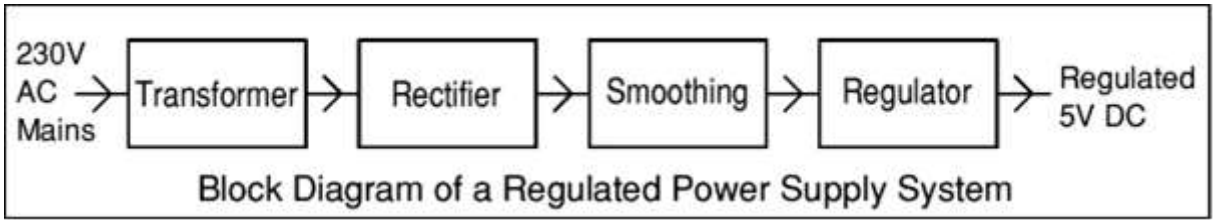

Block Diagram of a Regulated Power Supply System

Working Principle

Fire monitors and sprayers are an aim able and controllable high-capacity waterjet used to deal with large fires. Unlike Fire extinguishers, Fire Monitors are permanently installed and cannot be moved. While traditional fire monitors systems need a human operator to change the direction of the water jet and aim it appropriately, this fire monitor has been equipped with embedded control.Thereby allowing the user to operate it from a safe distance. The system makes use of a Motor coupled with a powerful sprayer pump with piping system and onboard wireless Bluetooth to run this system. Another motor is used to control the nozzle direction movement.

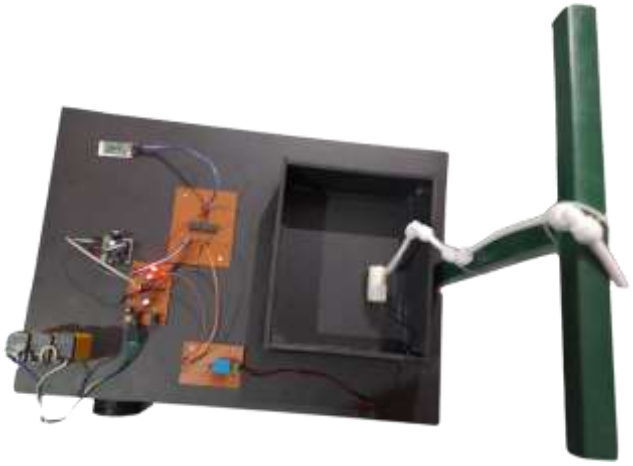

Fig.-1: 360 degree fire protection Robot

Conclusion

Fire has always been a devastating phenomenon but the technology advancements it become easier to tackle it. Firefighters try their best to respond quickly to case of fire and event put their lives at risk of they endeavor to save human life and protect property from the fires. Some attempts have been made to automatic fire fighting for the navy (ship board autonomous firefighting robot). This paper describes one such solution to the problem of fire fighting with helpof 360 degree fire protection system.

In conclusion there are many possible ways to put out fires but it always safer to use the constantly this idea to reduce the involvement of fire fighters thereby decreasing the risk of physical injuries and life threats. Comparing this prototype with the existing technology we implement the Bluetooth and wireless technology. Nowadays the firefighting technologies are fully manual. in scope of future we implement wireless technology to control the fires.

Overall, a fire-fighting robot that can be controlled from some distance has been successfully developed. It has advantageous features such as ability to detect location of fire automatically besides having a compact body and lightweight structure. The operator is able to extinguish fire using remote control from longer distance. In future during the process of firefighting by using the camera that is connected to the smartphone.

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