

Automatic Fire Extinguisher

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Abstract –Disaster of fire is a common problem to lives and property. An automatic fire extinguishing strategy provides real time monitoring, alerting and also extinguishing the fire. This paper involves the design of a low cost, robust and secure fire protection system for commercial buildings and also domestical buildings. It automatically extinguishes the disastrous fire that occurs accidentally and helps to reduce the disastrous damage caused by it. This project device consists of smoke detector, flame detector and a temperature sensor whose outputs are connected to the solenoid valve and a cooler fan. The system takes into consideration of density of smoke and then the over usage of extinguishing material can be avoided.

Index Terms - Real time , monitoring, exploration and programmed fire alarm, robust secure fire protection system.

I. INTRODUCTION

Conventional fire extinguisher is critical to convey people immediately after the fire and also people cannot act spontaneously .A census states that in India, 35 people die every day due to accidental fire. Did you know, over the last four years, we have lost 60,507 lives due to fire (2015- 2018). In 2018, in an fire accident 13099 cases were reported and it is a decrease of 2.2% over 2017.Is the decrease because of under-reporting or are we seeing a shift in the number of fatalities from fire accidents. And 12748 people were died in fire accident and in that 35 Indian people were there.

Nearly 4,290 fire-related deaths were the people belongs to the age group between 18 and 30, followed by 3,860 people belongs to the age group between 30 and 45. These vulnerable age groups together account for 63% of all fire-related deaths. This paper shows an usage of a proficient and practical arrangement reasonable for railroad application at the point. If the fire is identified spontaneously and controlled automatically, the losses can be prevented.

II. LITERATURE SURVEY

Fire extinguisher of a device:

A Fire Extinguisher is made by storing pressure made by Anterex and it is an device which is active to extinguish and control fire often in the emergency.

It is then not used for out of control fire situation,(i.e., noescape route). And the fireextinguisherconsistsof a handheld cylindricalvessel and anagent that can beused to discharge fire. And there some extinguishers which are non - cylindrical and that are not commonly used.

Two types of extinguishers were there. They are 1. Stored pressure fire extinguisher and 2. Cartridge operated fire extinguisher. In stored pressure, expellant will be stored in the same chamber as the fire agent which can be able to fight. Different propellants were used based on the agents. Nitrogen which is used by Dry chemical Extinguisher; Air which is used in water extinguishers and foam extinguishers. Stored fire extinguishers, which is the most common type. Expellant gas which is used in Cartridge Operated Extinguishers in a separated cartridge which is punctuated before discharge of it, and it helps in exposing its propellant to its extinguishing agent. And it has an advantage that it is simple and it will be a prompt recharge, which allows an operator to discharge its extinguisher and then recharge it, and then return to its fire in some amount of the time which is reasonable. In cartridge types carbon dioxide were stored where as in stored pressure types nitrogen were stored, where nitrogen cartridges were used in low temperature (i.e., -60) models. Cartridge operated extinguishers were available in Dry Chemical Types and Dry Powder Types.

Classes of fire side

- Class A – fires caused because of the solid materials like wood.
- Class B – fires caused because of liquid combustion materials like gasoline, diesel or oils.
- Class C – fires which is caused by the gases.
- Class D – fires which is caused by metals
- Class E – fires which caused by live electrical equipment. (Technically Category “E” doesn’t exists, here it’s used for convenience)
- Class F – fires caused because of preparation oils like in deep-fat fryers.



Fig1. Fire Extinguisher.

III AUTOMATIC FIRE EXTINGUISHER

- AURDINO - Arduino is a single-board microcontroller board based on the AVR microcontroller architecture. It is a small, easy-to-use hardware and package.
- SMOKE SENSING ELEMENT - A smoke sensing element may be a device that senses smoke usually as a single-board microcontroller board based on the AVR microcontroller architecture.
- FLAME SENSING ELEMENT - A flame sensing element is employed to notice the presence of fire and jointly different infrared sources.
- SMOKE SENSING ELEMENT - A smoke sensing element may be a device that senses smoke, usually it's the indicator of smoke caused by fire. Industrial and residential security devices issue

a symptom to a fireplace alarm panel as a part of a fireplace fire extinguisher or any kind of fire device, whereas unit detected so called smoke alarms issue neighborhood audible or visual alarm.



Fig2. DHT11 Sensing Element.

- **DHT11** - It's a cheap digital sensing element for sensing temperature and humidity. This sensing element will be simply interfaced with any micro-controller like Arduino, Raspberry Pi etc., to live humidity and temperature instantaneously.
- **ESP8266 LOCAL AREA NETWORK MODULE** - the ESP8266 is capable of either hosting an application or offloading all local area network networking functions from another application processor.
- **SOLENOID VALVE** - A coil valve is an electromechanically-operated valve. Coil valves disagree within the characteristics of the electrical current they use, the strength of the magnetic field they generate, the mechanism they use to manage the fluid, and also the sort and characteristics of fluid they manage.
- **RELAY SWITCH** - A relay is an electrically operated switch. It consists of a collection of input terminals for one or multiple management signals, and a collection of operative contact terminals.
- **POWER PORT** - The Arduino board will be high-powered through an AC-to-DC adapter or a battery. The facility supply will be connected by plugging in a very a pair of 2.1 mm. center-positive plug into the facility into jack of the board. The Arduino UNO board operates at a voltage of five volts, however it will stand up to a most voltage of twenty volts. If the board is furnished a better voltage, there's a transform (it sits between the facility port and USB connector) that protects the board from burning out.

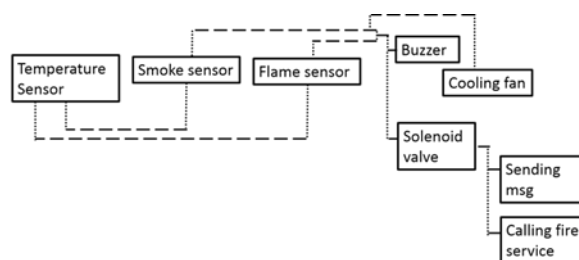


Fig3. Block diagram of Automatic Fire Extinguisher.

Class A: Fireplace in standard flammable materials. Examples: wood, drapes and paper.

Class B :Fires in ignitable liquids.

Examples: grease, petrol paintsolvents,heating oil and lamp oil.

Class C :Fires in live electrical instrumentation.

Examples: fireplace caused by faulty wiring, hot fuse boxes and deep-fried electrical cords.



Fig4. Hardware illustration of Automatic Extinguisher.

Software Description

With the all Arduino, with spectacular speeds and performance power compared to standard models, the Arduino have currently been a must-buy for all manufacturers and school enthusiasts. Arduino was unreal by Massimo Benzi in Italy. Arduino was a straight forward Hardware prototyping tool. Whereas raspberry pi is real by Eben Upton at the University of Cambridge within UK for rising the programming Skills of the Students.

These are each teaching tools square measure appropriate for Beginners , hobbyists . The most distinction between them is Arduino is microcontroller board whereas raspberry pi could be a Minipc. So Arduino is simply a section of raspberry pi. The Arduino project received associate mentioned honour within the digital communities at the 2006 Prix Ars Electronica.

IV. EXPERIMENTAL RESULTS

Class A and Class B fire extinguishers are built in a single device that can also extinguish automatically. By this we can avoid the worse destruction caused by fires due to human ignorance .

- Every lock is locked to open it, and every problem is to overcome it with a better solution.
- So, the above listed problems can be solved by:
just making it automatic.

But till, here we have a new problem that we should come up with different extinguishers to extinguish different types of fires.

So, we came up with a body which has some sensors that can detect its source and extinguish accordingly.



Fig5. Output of Automatic Fire Extinguisher.

V. CONCLUSION

Instead of using a conventional fire extinguisher but along with LM35, smoke sensor and flame sensor, gives a brilliant effect in public building. And it is also an innovative to use an fire extinguisher that can spontaneously extinguish the fire without the help of man.

Safety is always more important than property. And also sometimes we will be too frightened to extinguish the fire spontaneously or sometimes the fire can be large or there may be too smoke where we cannot conventional extinguisher . But this is not the case in our automatic fire extinguisher.

FUTURE SCOPE

The future scope of the work is to implementan equivalent procedure toany or all categories of fireplaces that ensures the whole answer for accidental fire issues.

Weare able to conjointly connect this with a air ballooncreated from insulant that utterly protects the product and resources from destruction.

With the all Arduino, with spectacular speeds and performance power compared to traditional models, the Arduino have currently been a must-buy for all manufacturers and technical school enthusiasts.

Arduino Was a straightforward hardwarePrototypingtool.Wherraspberrypi as unreal by Eben Upton at the UniversityOfCambridge within theUK for uptheprogrammingSkills of his students.

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