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Automated Toilet Cleaner with Minimal Cleaning Resources

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Abstract: Technologies are increasing day, and at the same time our major task is cleanliness. From this paper we spread the message of hygiene and cleanliness of our surrounding. We need to maintain the hygiene or cleanliness in publics place or toilets. In cities government provides many facilities to make our surrounding clean. This paper is helpful to keep the India clean called as "Swachh Bharat". In this system, we are targeting only on, how to maintain the hygiene in washrooms, and observing to the workers activities and also stopping the public to use the dirty washrooms. This paper are alerting to public about hygiene, and to keeping the surrounding clean. In our nation, sanitation has always been a major issue. Most significantly, this issue is not just concentrated to the rural areas but is also wide spread in urban and semi urban areas. People do not show the same level of concern when it comes to keeping the public sanitation is one of the goals to be achieved as per the Millennium Development Goals of the United Nations Organisation, 2000.

However in India, the scenario of public toilets is still dismal. One of the reasons for this is that the people do not bother to clean up after they use the toilet. These places are thus the breeding grounds of bacterial germs like Escherichia coli and many deadly diseases. Many people sometime prefer discomfort to using these toilets.

Looking at such troubles, the decision to construct a self cleaning toilet was made that simply utilizes the weight of the person using it as its working mechanism. The system consists of a platform supported on springs and the lever arrangement that flushes after use. The lever is pivoted in such a way that it will lower itself when weight is applied downward and when the load is released, this will strike the flush and hence in this way water is flushed out to clean the toilet. So, our main intension of this paper is safe, hygiene and disease free washrooms.

Keywords: Microcontroller, IR sensor, LCD, GSM module, Odor sensor, IOT

I. INTRODUCTION

IOT means Internet of things. It is the interconnection between computing devices. IOT has the ability to transfer the data over network without manual interventions. It is the huge network and the simple concept connecting all computing devices to the network in the world. Simply, it transmits or receives the information with the help of media/ devices or using sensors. IOT is important architectural framework. It allows data exchange and integration between the computers a physical world over existing network infrastructure.

At present only Mobiles, Computers, Tablets and Smart TV is connected with internet. By using IOT all the devices e.g. Coffee maker, A.C, Washing Machine, Ceiling Fan, lights almost anything you think of having sensors can be connected with internet.

The project Development of a smart toilet for automatic cleaning deals with automatic cleaning of Indian toilets without requiring any human assistance. Most of the public toilets are not clean due to the irresponsible peoples who

often forget to flush the toilet after using it. In India all the state and central government $A = \pi r^2$ allotting numerous funds for constructing public toilets. The central government under "SWACH BHARAT MISSION" has built a vast amount of new toilets to provide the citizens a healthy and hygienic environment. Therefore cleaning of public toilets is

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equally important as cleaning of household toilets. So we have developed a mechanism to flush the toilets automatically by utilizing the human weight. The mechanism does not require any external power or human concern. Rather, it just works civilly utilizing the weight of the person sitting on it.

II. EXISTING SYSTEMS

Some automatic cleaning systems do exist in the market, but they are too expensive due to their complex construction. They generally use some optical or electrical sensors to detect the presence of a person using the toilet and accordingly theyoperate. They are found to be used in airports, shopping malls, multiplex etc. Buttheir use in the public toilets is not possible due to the excessive cost and frequent maintenance

NEED FOR AUTOMATIC SPRAYER

In India Railways and Bus transports plays major role in peoples migration. Per day around25 million peoples travels by bus and 23 million peoples travels by train.

Among this 60% of peoples use a public toilets. But most of the toilets are uncleaned and bacteriafilled.

Peoples are infected by these bacteria and suffered by fever and various sexually transmittedorganism diseases. So this system should be clean and bacteria free.

WORKING

In our project, human detection sensor detects the presence of the humans. Is there a of the human the sensor send a signal to the at mega micro controller and programmed chip operate the pump. The pump pumps the liquid from the storage and sprays to the required areas. here we use a 5,12V SMP for the power supply.

ADVANTAGES OF THE DEVELOPED MECHANISM

- No human effort required.
- Mechanism is robust
- Economical

Important internet of things component

IOT is an independent technology. Interestingly internet of things is being enabled by the presence of other independent technologies which make fundamental components of IOT. The fundamental components that make internet of things a reality are:

Hardware: Making physical objects responsive and giving them capability to retrieve data and respond to instructions Software: Enabling the data collection, storage, processing, manipulating and instructing

Communication Infrastructure: Most important of all is the communication infrastructure which consists of protocols and technologies which enable two physical objects to exchange data

In our country, people do not have enough knowledge of how to use washroom and they really don't know how to maintain proper hygiene. This leads to several diseases, such as Malaria, Hepatitis, Flu, Cholera, Streptococcus, Typhoid, etc. Hence we introduce the concept in the IOT called "Swachh Shithouse". The term Swachh means 'Clean'. Then the term Shithouse means 'Toilet'. It introduces to use and to maintain the toilets in the clean and hygienic way. The paper is based on IOT concepts using different sensors like smell sensor, dirt sensor, sonic sensor, RFID reader and database. Using these materials we are trying to provide the clean toilets and create the awareness among the people.

The main aim of this paper is to keep our surrounding clean. This paper helps to avoid infections, which occurs from common washroom. This system is helpful to create bacteria free washrooms. Toilets in public places like Universities, Schools, Offices, etc. as people use the public washroom bacteria level increases. According to the survey of doctor national medical, the infection of urinary tract is near about

8.3 million per year.

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Over view of sensor based mechanism

Sensor:

Methane sensor is the device widely uses to detect and monitor level of methane in environment. Methane is natural gas used as fuel to make heat and light. It prevents industrial safety danger. Ammonia is a colorless gas, it affects on skin, eyes. The range of ammonia gas sensor is 0-50ppm, 100ppm or 0-500ppm. It works on the electrochemical principle used for measuring the partial pressure in the environment. It is the safety device and gives the information about the small leakage from pipes.

Turbidity Sensor:

Turbidity sensors can be used in measurement of water quality in rivers and streams, waste water and effluent measurements, sediment transport research and laboratory measurement as well as in many water bodies.

IR sensor:

IR sensor means Infrared sensor. It is an electronic instrument or sensor which measures the infrared light from the object. It is capable to measure the heat. It is the simple circuitry and IR sensor requires low power. This technology is implemented in night vision.

BLE Beacon Technology:

BLE stands for Bluetooth low energy device. It is small Bluetooth radio transmitter, powered through batteries. It is similar to a lighthouse in functionality and capable to scanning and displaying signals. BLE beacon transfer small amount of data at regular interval of time.

Plant fibers including banana, snake grass, ramie, hemp, jute and so on are armed with enormous advantages like less weight, reliability, recyclability and environmental friendly nature. Besides the natural composites with single fibers, composites containing more than one type of fibers (hybrid composites) render a customized material design which could be used to obtain a particular property for a particular application. Current work is an attempt to manufacture and test the snake grass (SG) and banana fibers reinforced polyester composites manufactured by hand lay-up method with random fiber orientation. Methyl ethyl ketone peroxide (MEKP) was used as the coupling agent and cobalt naphthalene (CN) as the catalyst. Relative volume fraction of the fibers was varied between 5%–25% by weight in the ratio of 1:1. Properties like tensile strength and modulus, flexural strength and modulus and compressive strength are measured for the composites by conducting the appropriate tests according to ASTM standards.

III. HARDWARE & SOFTWARE TOOLS

- Microcontroller Atmega328
- LCD Display
- RF Transmitter/Receiver
- GSM Module
- Odor Sensor
- IR Sensor
- Dc Power Supply
- Ammonia Sensor
- Relay
- Water Motor
- RFID Reader Module Following Software tools are required:
- PCB Artist For PCB Design
- Atmel Studio 6.0 Compiler
- Proteus For Circuit Des

IV. CONCLUSION

The entitled project Development of a Smart Toilet for Automatic Cleaning aims to achieve a cleaner and more hygienic public toilet system in rural, semi urban and urban areas in the near future. We want to broadcast the project as

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a public welfare initiative. In rural areas, there is scarcity of electric power and hence our design will be best suitable. This design utilizes the weight of the person in cleaning the toilet and hence is a rather simple mechanism. This project is aimed to contribute to the Central Government Scheme of "Swachh Bharat Abhiyan" where each and every citizen of thenation is entitled to have a cleaner and hygienic future.

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