

Automatic Waste Collecting System at Public Transport

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ABSTRACT Now a days, the plastic waste management is the most challenging one for the government. The plastic or polyethylene and plastic paper waste thrown out while travelling in bus or other large public transport vehicle is deposited on the road side and hill station sometimes it may block the drainage system and pollute the land .By implementing the waste collecting system inside buses which reduce such kind of problems. The flat belt conveyer which is operated by means of solar powered electric motor is placed just nearer to the side doors of either side of the bus to collect that kind of wastes and stored in the waste storage tank which is fitted in the bus in particular interval of time. This system is designed to use on all vehicles but this is highly efficient on the vehicles which drove over long distance (more than 100 kms), because the passengers who travels more produces more wastes.times the value of KDP. Theoretical HOMO LUMO studies were also done for the crystal.

Keywords: Box type belt conveyer system, collecting tank, solar powered electric motor

1 Introduction

This mission aimed to join each and every Indian people from all walks of life by making the structure of branching of a tree. Swachh Bharat mission aimed to construct individual sanitary latrines for household purposes for the people living under poverty line, converting dry latrines into low-cost sanitary latrines, provide facility of hand pumping, safe and secure bathing, set up sanitary marts, construct drains, disposal of solid and liquid wastes, enhance health and education awareness.

The environmental sanitation and personal cleanliness were launched by the Indian government however could not be so effective to make India a clean India. The main objectives of Swachh Bharat Abhiyan are removing the trend of open defecation, changing insanitary toilets into pour flush toilets, removal of manual scavenging, proper

disposal of solid and liquid wastes, bring behavioral changes among people, enhance awareness about sanitation, facilitating the participation of private sectors towards cleanliness facilities. The present landfill method creates land pollution (and in most cases, ground water contamination). The waste is not sorted for recycling, composting or any other form of environmental treatment. Hazardous toxic wastes lie side by side with organic wastes in the landfill. Quite often, the garbage is dumped in the bank of the neighboring river. The state of the Yamuna River in Delhi is a testimony to this fact. The river practically doesn't flow at all and expansive white deposits can be seen on the surface which prevents the flow, these are toxic wastes that have reacted with the water. Practically, there is no living creature in this section of the river. In fact, by polluting the ground water and soil, the toxins have entered the

food chain through vegetables grown in the banks of the river. In most rural areas there is no organized garbage collection and it is dumped on the nearest vacant public land earmarked for cattle grazing and other public purposes. Also, the land by the sides of the passing railway lines is littered with paper, plastics, bottles etc. thrown by passengers from the passing trains. The average railway passenger generates 64 grams of garbage and with 1.4 million passengers in a day; this comes to 3980 Tons per day [6]. There are many different ways of permanently changing the land, from soil contamination (poisoning by chemicals or waste) to general urbanization (the systematic creation of cities and other human settlements from Greenfield, virgin land). Some, such as huge landfills or quarries, are very obvious; others, such as atmospheric deposition (where land becomes contaminated when air pollution falls onto it) are much less apparent. Let's consider the main causes as shown fig.1 and types of waste produce.

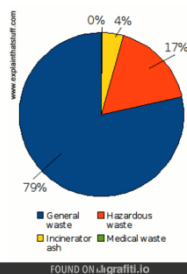


Fig.1.The types of waste produce status

2. Effects of Land Pollution

With luck and the right atmospheric conditions, air and water pollution disperse and disappear. What makes land pollution such a problem is that land is static, so land pollution stays exactly where it is until and unless someone cleans it up. Land that's polluted stays polluted; land that's urbanized almost invariably stays urbanized. As we've already see, plastics take hundreds of years to

disappear while radiation can contaminate land for ten times longer. That means landfill sites and radioactive waste dumps remain that way pretty much indefinitely. No-one knows how much land is contaminated, how contamination varies from one place to another, or how land contaminants react water pollution as shown in fig.2. So the scale of the problem and its ultimate effects are impossible to determine.



Fig.2.the major cause of land pollution

3. Flat Belt Conveyor System:

A flat conveyor belt is the carrying medium of a belt conveyor system (often shortened to belt conveyor). A belt conveyor system is one of many types of conveyor systems. A belt conveyor system consists of two or more pulleys sometimes referred to as drums with an endless loop of carrying medium the conveyor belt that rotates about them. If the conveyor system shown as fig.3

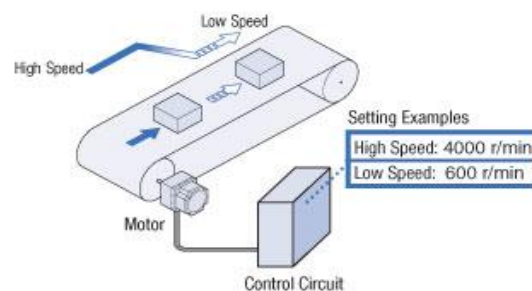


Fig.3.the setup of conveyor system

One or both of the pulleys are powered, moving the belt and the material on the belt forward. The

powered pulley is called the drive pulley while the unpowered pulley is called the idler pulley. There are two main industrial classes of belt conveyors; those in general material handling such as those moving boxes along inside a factory and bulk material handling such as those used to transport large volumes of resources and agricultural materials.

4. Main Components:

The automatic waste collecting system consist of components such as

Sheet metal required size (mm)

- DC motor (12V)
- Solar panel with 12V battery
- Waste Collecting bucket
- Rollers
- Belts
- Brush (cleaner)
- Single Channel Relay
- programmed Arduino Nano

4.1 DC Motor:

12V DC Series motor is used in this experiment, which converts electrical energy into mechanical energy. Its location is based on the principle that when a current carrying conductor is placed in the magnetic field, it experience a mechanical force whose direction by Fleming's left hand rule. if geared motor as shown in fig.4. For conveyor belt applications Oriental Motor offers a wide range options. For fixed or constant speed applications, AC motors & gear motors are well suited.



Fig.4 Geared dc motor

4.2 Solar Penal With Battery Setup:

The solar panel converts sunlight into DC electricity to charge the battery. This DC electricity is fed to the battery via a solar regulator which ensures the battery is charged properly and not damaged. DC appliances can be powered directly from the battery, Some DC appliances can be connected to the regulator to take advantage of the Low Voltage Disconnect and protect your battery. If the basic solar power system is shown fig.5.

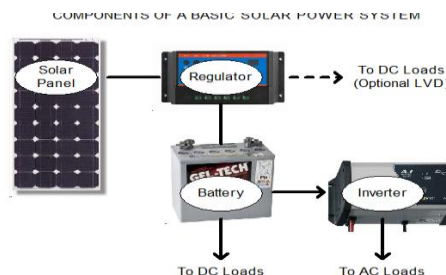


Fig.5 basic solar power system

4.3 Single Channel 5Volt Relay:

A relay is an electrically operated device. It has a control system and (also called input circuit or input contactor) and controlled system (also called output circuit or output cont actor). It is frequently used in automatic control circuit. To put it simply, it is an automatic switch to controlling a high-current circuit with a low-current signal. If the single channel relay shown as fig.5



Fig.6 single channel 5Volt Relay

4.4 Arduino Nano:

Arduino Nano is a microcontroller board designed by Arduino. The microcontroller used in the Arduino Nano is Atmega328, the same one as used in Arduino UNO. It has a wide range of applications and is a major microcontroller board because of its small size and flexibility. So, now let's have a look at its basic features. If the Arduino Nano shown as fig.7

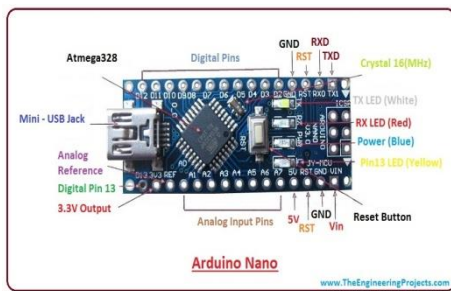


Fig.7 Arduino Nano

4.5 Working Algorithm:

The entire system works on the power source which based on solar power (50 watts). The conveyor motor is given by 12V 4amps (48 watts) to start up the process of dust collection in the vehicle. The motor starts to convert the electrical energy to mechanical energy which results on running the conveyor by the driven pulley and it achieves the Slider-crank mechanism (Rotary to linear motion conversion). The solar energy is stored in a battery when it acquires a full source of producing 50 watt and used when the low lightings and night timings. The proposed system works on the moving of the conveyor belt from one end of the pulley to the another end, by the way it get passed by the timing programmed to the Delay timer, the motor turns on and off simultaneously and automatically, and conveyor system running time was green indicating, because one of the safety purpose. Thus the process of moving the conveyer the passenger or the user of the provided system places the dust or unwanted particle through the manual opening on the flat belt conveyor it moves the particle to

the dust storage area allotted on the vehicle since the systems winding area will always be the dust storage.

5. RESULTS

5.1 Result of Installation:

This automated conveyor system is mounted to the side of the seats and the top or bottom of the bus window. The solar panel which is placed on the top of the bus makes the entire conveyer system to run. The usage of solar power makes the null consumption of the battery which helps the vehicle to run and makes a way to save the battery power, which results on the saving of power when the vehicle is idle and ignores the chance of Starting trouble.

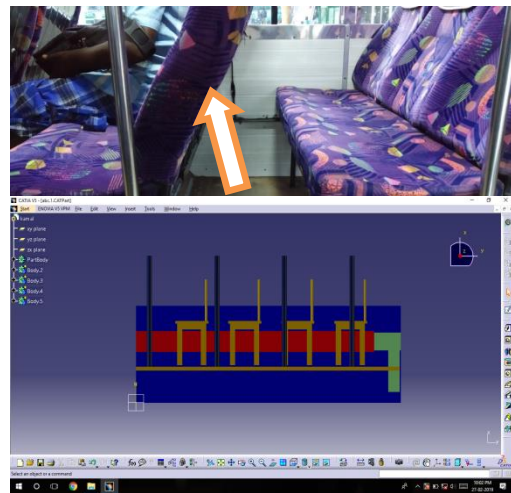


Fig.9.model1implementation area

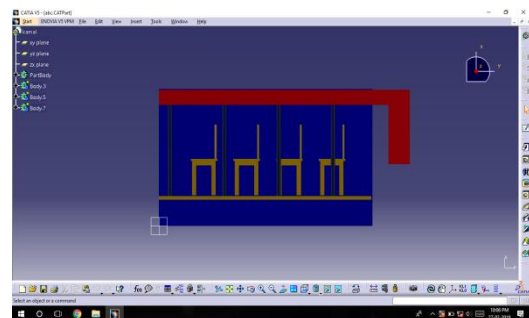


Fig.10. design of model no 2



Fig.11. model 2 implementation area

5.2 Result on conveyor design:

The design and view on CATIA 3D modeling software provides.

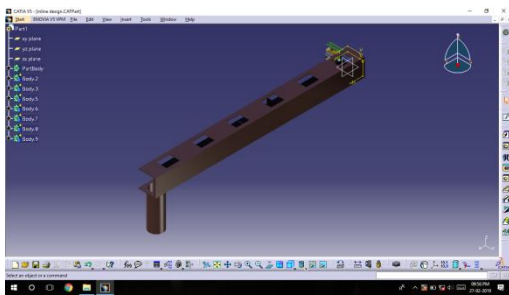


Fig.12.the isometric view of box type flat belt conveyor system

The above figure gives the CATIA model and its implementation space of the conveyor on the vehicle for the usage of the passenger.

5.3 Recommendations and prospects

The proposed system will enhance the clean environment on the public places which is mostly used now a days, the system mainly concise of safety measures of the user too. To make the clean environments of our country and the improve on un educating people get the employment offers. And the kindly recommendation for this innovation providing on public transport vehicles so everyone people use this innovation for carrying waste, and to make the clean India.

6. Conclusion

The provided system overcomes all the problems which are currently giving impact to the world. The system given ensures a better solution social, environmental and human power issues. Social issues includes waste management and the human power issues such as collection of the waste form the dust collector from each vehicle can be carried out by the human power which is lagging now a days. The system also deals with environmental issues such as the Land pollution by polythene bag usage and its irregular disposal and the blocking of sewage by the irregular disposal of wastes and the domestic harassment by the waste products.

The overall benefits of the system are given as;

- Pollution control
- Human power enhancement
- To provide a Clean India

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