



## Implementation of Plastic Waste Recycling Based Reward Generation System

Ashwin Ganvir, Payal Bhagat, Pallavi Dardemal, Durga Banjare, Dr. Jagdish Chaudhari

Electrical, RTMNU/Nagpur Institute of Technology, Nagpur, Maharashtra, India

### ABSTRACT

There is increase in rate of plastic waste in all over the world .so this is our concern to reduce the pollution cause due to plastic waste, because plastic is non-biodegradable material. Therefore number of researchers and industries are focusing on how to reduce this waste Aiming at the problems of on-site plastic bottles recycling and the reuse of waste, the automatic recycling system was developed on the basis of ATmega328p micro-controller. As the main controller, ATmega328p not only controls the mechanical system of the collector to recover and break plastic bottles, but also communicates with and rewards the user by the automatic rewards system through the wireless network. The experimental results shows that post treated fragments of plastic bottles are small which are easy to transport. Advantage of this is, the recovery operation is easy and the interface of non machine interaction is friendly which is easy to expand functions. The new recovery recovers and smashes the plastic bottles through technical system, and communicates with users through automatically reward system and reward the latter.

**Keywords :** ATmega328p, Mechanical System, Micro-Controller, Polyethylene Terephthalate

### I. INTRODUCTION

In many cities people use huge amount of plastic waste which leads to the increase in pollution. India is a populous country, where a huge amount of water bottles are consumed everyday, especially in densely populated areas. In the cities flourishing areas, randomly discarded plastic bottles can be seen everywhere. India generates nearly 26000 tonnes of plastic waste everyday. During monsoon plastic bottles at dump accumulate water and a breeding ground for mosquitoes. Besides the stench, the site poses a major health hazard for the areas residents, exposing them to the mosquito-prone diseases.

PET (Polyethylene Terephthalate) of plastic bottle is also a raw material of polyester staple fibre and filament yarn. The recycled plastic waste can be made

into fibers by doing simple treatments and then it can be easily converted into clothes. Environmentally aware people will put waste plastic bottles into trash, no such conscious people through plastic bottles away, thus causing environment pollution. Therefore in order to reduce environmental pollution, renewable resources usage, and development of dedicated intelligent recovery is necessary. This paper uses ARM family embedded sensors, controllers, relays and other electrical components to control the collector mechanical system for crushing the plastic bottles; certain incentives were given to people who get back those bottles, and the reward also submitted via wireless network to a remote server to be handled. Recycling box developed reduces the environmental pollution caused by plastic bottles, encourages people to recycle plastic bottle, facilitates the transport of

waste plastic bottles and play an active role for construction of conservation oriented society.

## II. BLOCK DIAGRAM

The transformer is connected to the bridge rectifier which converts AC supply into DC supply. Now the DC supply goes to 7805 in which convert the given variable voltage into constant 5V DC supply and the remaining voltage get stored into the capacitor. The 5V supply is given to the ATmega328p microcontroller. In the microcontroller two sensors are connected IR1 and IR2. One for keypad sensing purpose and another for GSM tracking system

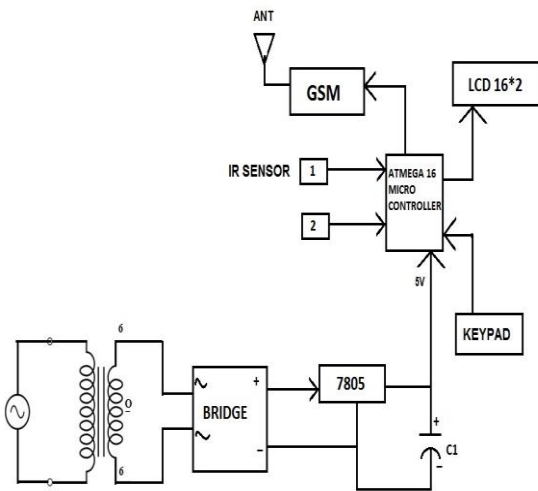
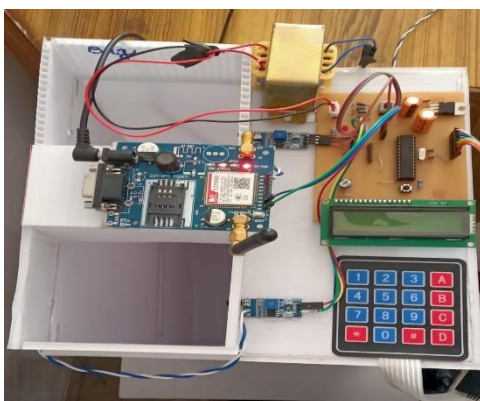


Fig 1. Block diagram of plastic waste recycling based reward generation system

## III. MODEL IMAGE



## IV. METHADODOLOGY

1. Take the print of PCB on glossy paper.
2. Take copper plate and copy that design on it.
3. Now dip that copper plate in etching solution and shake it for 15-20 minutes.
4. Now, take out that copper plate and clean it with isopropyl alcohol.
5. Drill the plate accordingly and solder the components.

## V. LITERATURE SURVEY

1. Paris Climate Change Conference, “United Nations Framework Convention on Climate Change,” Available at: [http://unfccc.int/meetings/paris\\_nov\\_2015/meeting/8926/php/view/decisions.php#c](http://unfccc.int/meetings/paris_nov_2015/meeting/8926/php/view/decisions.php#c), 2015 (accessed 2017.04.27).
2. Thuc and C. N. H. Thuc, “Biodegradability of polymer film based on low density polyethylene and cassava starch,” International Biodeterioration & Biodegradation, vol. 115, pp. 257-265, 2016.
3. R. Bouza, “Morphology, thermal and barrier properties of biodegradable films of poly”
4. European Union Council Directive, “1999/31/EC of 26 April 1999 on the landfill of waste,” Available at: <http://eur-lex.europa.eu/legalcontent/EN/TXT/?uri=CELEX:31999L0031>, 1999 (accessed 2017.04.27).
5. Canadian Plastics Industry Association, “A Canadian Review of Energy Recovery Technologies,” Steven Sawell, University of Waterloo. Available at: <https://www.plastics.ca/PlasticTopics/EnvironmentalSustainability/WasteManagement> (accessed 2017.06.11).

6.TWMO (Tehran Waste Management Organization), "Evaluation of the statistics of waste production in Tehran city from 2008 to 2012, published in 2013" Urban Service Department, Deputy of Urban Planning and Development. More statistics on the website; Available at: <http://pasmand.tehran.ir/Default.aspx?tabid=481#124690>----- and <http://pasmand.tehran.ir/Default.aspx?tabid=481#124691>----- (accessed 2017.05.03), <https://pasmand.tehran.ir/Portals/0/Document/misc/93.2.pdf> (accessed 2017.06.28).

## VI. PROBLEM FORMULATION

### Existing System

There is huge amount of increase in use of plastic bottles in country like India. Because plastic is a non-biodegradable substance. The increase in use of plastic bottles, it causes harm to environment and living beings too.

### Proposed System

To overcome this problem of increasing plastic waste we proposed a recycling based plastic waste reward generation system. In these people will get reward if they dispose the plastic bottles in this bin.

## VII. PROBLEM OBJECTIVE

Due to overuse of plastic in environment, the pollution is increasing because plastic is a non-degradable material. Pollution is increasing day by day because of this problem the plastic waste management is necessary. The main objectives of these

- To reduce the use of plastic and beneficial management of plastic.

- To establish eco-friendly plastic waste disposal solution.
- Promoting recycling of plastic.

## VIII. RESULT AND CONCLUSION

Thus we have successfully made the bin in which plastic bags and bottles can be recycled and the reward can be generated. It not only broaden the technology's application field, but also enhance the technical level of waste treatment, moreover meet people's curiosity for new things, thus achieved the purpose of waste recycling. The result shows the good effect of collector recycling and plastic bottle treatment. After on-site disposal, the plastic particles are very small, which is either good for transport or facilitate following reuse of plastic. Moreover the recycling box Improves the users participation, autonomy and interesting through on board reward interactive interface, significantly reduce labour cost through the integration of network information auto management.

## IX. REFERENCES

- [1]. C. Zhang, Guangming Daily, 2011 (4)
- [2]. X. Lin, Worker's Daily, 2011 (6)
- [3]. X. Wang, M. Kang, X. Jin, Machine Tool & Hydraulics, 2011(7):18-20
- [4]. X. Lai, J. Liu, S. Li, Machine Tool & Hydraulics, 2011(3):86-88
- [5]. S. Han, Y. Guo, H. Fu, ARM Microprocessor Application Development Technology Explanation and Example Analysis, Beijing:Tsinghua University Press, 2007
- [6]. Z. Xie, Integrated Design of Electronic Circuits,Wuhan:Huazhong University of Science and Technology Press, 2006

- [7]. Y. Li, Arm Embedded Linux system development From Entry to Master(Tsinghua University Press, Beijing, 2007)
- [8]. T. Sun, Manual of Embedded Design and Linux Driver Development(2nd)(China Electric Power Press, Beijing, 2007)