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Design and Fabrication of Eco-Brick Making Machine

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Abstract: ***The aim of our project is development of an Eco-brick making machine. In this machine we try to overcome the problem associate with plastic waste. In India huge amount of plastic are used (almost 11 kg per year) for various purposes such as, for making of water bottle, soda bottle and bags etc. which are not disposable because of this various problem occurs, so we use waste plastic bottle for making of Eco-brick by the help of Eco-brick making machine. After studying we develop the effective way to overcome this problem. Eco-brick are light in weight and withstand high amount of load or pressure. Eco-bricks, polyethylene terephthalate (PET) bottles filled with mixed inorganic waste, have become a low cost construction material and a valid recycling method to reduce waste disposal in region where industrial recycling is not to yet available.***
Keyword: Eco-bricks, plastic waste, pet bottle, reduced waste, better recycling option, plastic bottle, bottle bricks.

I. INTRODUCTION

An Eco-bricks is a plastic bottle packed with used plastic to set density. They serve as reusable building blocks. Eco-bricks can be used to produce various items, including furniture garden walls and other structure. Eco-bricks are produced primarily as a mean of managing consumed plastic by sequestering in and containing it safely, by terminology reduce ding the net surface area of the packed plastic to effectively secure the from degrading into toxic and micro plastic. Eco-bricks is used to minimize the cost construction as well as to use eco-friendly materials and it is light weight so it is good choice. Plastic is a very common material that is now widely used by everybody in this world. Through plastic is very useful material that is flexible robust and rigid they become waste after their and they pollute the atmosphere. So the plastic very good for making eco-bricks. It reduce the construction cost and it also reduce the material cost. It is very good replacement of bricks because it saves the environment. They serve as reusable building blocks. Ecobricks can be used to produce various items, including furniture, garden walls and other structures. Ecobricks are produced primarily as a means of managing consumed plastic by sequestering it and containing it safely, by terminally reducing the net surface area of the packed plastic to effectively secure the plastic from degrading into toxins and micro plastics. Ecobricking is a both an individual and collaborative endeavor. The ecobricking movement promotes the personal ecobricking process as a means to raise awareness of the consequences of consumption and the dangers of plastic. It also promotes the collaborative process as a means to encourage communities to take collective responsibility for their used plastic and to use it to produce a useful product. Typically, producers manually pack plastic into the plastic bottle. Any size of transparent polyethylene terephthalate (PET) plastic bottle can be used to make an ecobrick. The bottle and the packed plastic are clean and dry to prevent the growth of bacteria. Plastic is cut or ripped into small pieces then packed little by little, alternating between adding the plastic and compacting it, layer by layer. The bottle is rotated with each press to ensure the plastic is evenly compacted throughout the bottle. This helps prevent voids and allows the packing to reach the requisite solidity needed for building block applications. Completed ecobricks are packed solid enough that they can bear the weight of a person without deforming—a density range between 0.33 g/ml and 0.7 g/ml. Maximizing density minimizes the flammability of the ecobrick while increasing its durability and re-usability.

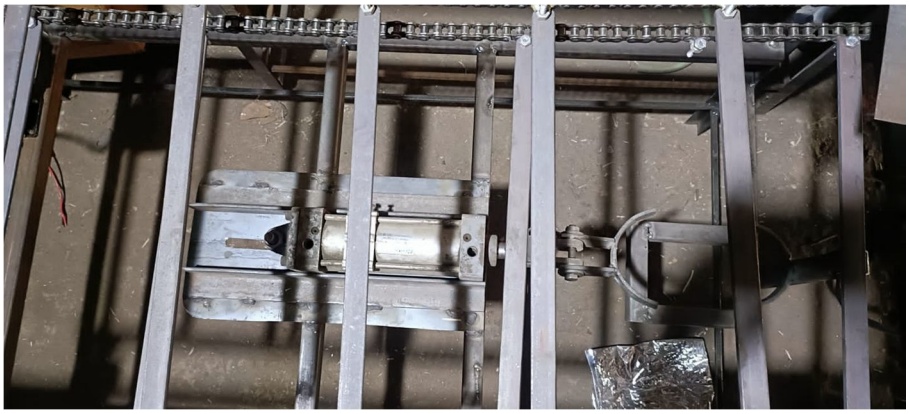
II. COMPONENTS

1) *Double Acting Pneumatic Cylinder*: A double acting pneumatic cylinder has two parts that control the movement of the rod. The compressed air causes the rod to moving two directions by extending and retracting with the assistance of springs. This type of pneumatic cylinder is essential for any application that need control of movement in two direction.
2) *Directional Control Valve*: Directional control valve are used in pneumatic system to direct or stop the flow of compressed air or oil to their appliances. They are probably the most used elements in pneumatic systems and can be used for example to actuate a cylinder, a larger industrial valve or air tools. The valve can have two or more parts and fulfill various circuit function. The function and behavior of the valve can be indicated by a symbol. The symbol however doesn't explain the construction of

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the valve. Directional control valves can be actuated by different means, such as manual actuation or solenoid actuation. These article focuses on the different directional solenoid valves for pneumatic systems.

3) *Air Compressor*: An air compressor is a pneumatic device that converts power into potential energy stored in pressurized air (i.e. compressed air). By one of several methods, an air compressor forces more and more air into a storage tank, increasing the pressure. When the tanks pressure reaches its engineered upper limit, the oil compressor shuts off.
4) *DC Motor*: DC Motor is any of a class of rotary electrical motors that converts direct current (DC) electrical energy into mechanical energy. The most common types rely on the forces produced by induced magnetic field due to flow in current in the coil. Nearly all types of DC motors have some internal mechanism, either electro-mechanical or electronic, to periodically change the direction of current in part of the motor.
5) *Conveyor Belt*: A conveyor belt is the carrying medium of the belt conveyor system. It is used to carry a material. It transfer the plastic waste to double acting cylinder. The conveyor belt consist of roller which rotates continuously and it also rotates belt. It consist of two or more pulleys, with a closed loop of carrying medium that rotates about them.
6) *Micro-controller*: Micro-controller is a small computer on a single VLSI integrated circuit (IC) chip. A micro-controller contains one or more CPU's (processor cores) along with the memory and programmable input/output peripherals. Micro-controller controls the speed of double acting pneumatic cylinder, the pressure of double acting pneumatic cylinder, rotation of conveyor belt.



III. STUDIES AND FINDINGS

Material selection is based on the application, strength, toughness and machinability. The design of conveyor belt is performed in such a way that the plastic waste transferred under a double acting pneumatic cylinder. The mechanism of double acting pneumatic cylinder is placed in such a way that the plastic waste is pressed under the bottles.

IV. CONCLUSION

The design procedure of choosing micro-controller for regulating the inserting force of plastic waste in bottles and calculating parameters of filling the bottles. The proposal made in this paper is very intensive and includes the problem of recycling of non-degradable plastic waste. Through this design we reduce manpower.

V. ACKNOWLEGDEENT

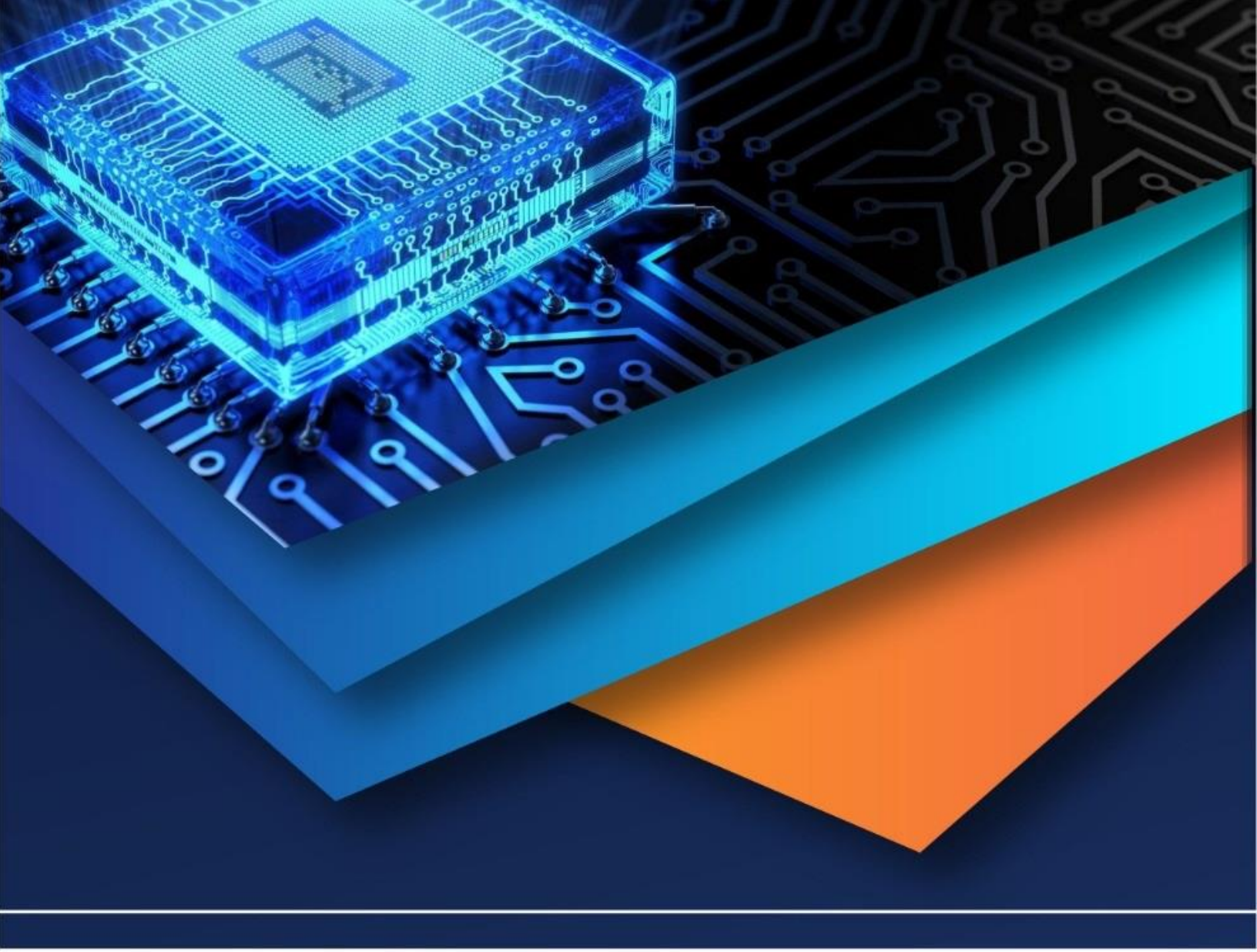
With profound feeling of immense gratitude and affection, we would like to thank our guide, Department of Mechanical Engineering for his continuous support, motivation, enthusiasm, and guidance. His encouragement, supervision with constructive criticism and confidence enabled us to complete this Project. We also put forth our deepest sense of gratitude towards Principal, for constant motivation and providing necessary infrastructure. Finally, a special thanks to all the faculty members of the department for their cooperation throughout the Project work. Authors and Affiliations.

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