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# Design and Fabrication of Arduino Based Stamping Machine

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**ABSTRACT:** This paper present the design and fabrication of anArduino based stamping machine. The overall system is controlled by Arduino and stamping action is carried out by the pneumatic system. This system can be used in small microscale business. Where there is issue of manpower this can be also used in engineering college for student practical experience of the automation. For interest rates this system gives faster operation and less men power acquired and it is more reliable than conventional stamping process. This is team consists of pneumatic cylinder , DC gear motor, self-inking Stamp, Arduinocircuit, SMPS, etc. the need to make this system is makes stamping process more affordable, reliable, easy to use and compact for small-micro enterprises and for education purpose also .

**KEYWORDS:** Arduino circuit, pneumatic cylinder, 5/2 DCV, IR proximity sensor, conveyor belt, DC gear motor

## I. INTRODUCTION

The traditional process for stamping objects is laborious, time-consuming, and non-automatic. Constant stamping wears out the hands and makes the output less accurate. The use of automation in conjunction with control systems and information technologies is the only way to reduce the need for human labour in the production of goods and services. Automation goes beyond mechanisation in the context of industrialisation. The importance of automation is increasing both in the global economy and in daily life. In today's automated environment, everything is completed with more accuracy and precision. According to one definition, automation is “the use of control systems such as pneumatic, hydraulics, electrical, electronics and computers to regulate industrial machines and processes, decreasing the need for human interaction”. if a larger production is needed, up to seven workers per line may be needed. and if small size enterprises need to remain competitive while maximising profit, automated stamping is required to generate increased productivity and reduce significant cost.

Automation must be used to replace the human approach. Because to its dependability and reproducibility, automated stamping of objects has drawn considerable interest. This not only reduces manual labour but also frees up more time for marketing and eliminates any potential risks associated with working in potentially dangerous environments. Automation significantly boosts production and profit. To identify and validate crucial information like the product registration number, the production date, and the expiration date that complies with legal and regulatory requirements for the various sectors, the stamping process is integrated into the packing operation.

## II. LITERATURE SURVEY

A Gundawar, Y Shahane et. al. [1] In this paper titled “Pneumatic Stamping Machine” The idea behind the project is to create a pneumatic stamping machine at a very low cost. Pneumatic control systems are widely used in our

society, especially in the industrial sectors for the driving of automatic machine. It having advantage of low power consumption and efficiency performance and many feature of the system.

Mr. Ravipothina, B. Raju et. al. [2] in this paper titled “Automatic Pneumatic Stamping Machine” important a role in due to it are precision and cost. The advantage one of no skill operator required pressure required up to six bar it is very economical available to the people It can be used medium scale industries for their product ladling and stamping. so thereby making such automatic stamping machine are very economically too available to the public.

Mr. Pimpalgaonkar et. al. [3], Automatic stamping machine for post card to overcome the usage of manual repetitive stamping work. In works on the principle of utilizing electric energy to for small thickness. The general purpose of the present invention, which will be described subsequently in greater details, is to provide a portable automatic pneumatic stamping machine.

Mr. Arun S, et, al. [4] The proposed work describes the design and fabrication of prototype of automatic punching machine controlled by PLC on the working principle and the hardware structure of the system. Punching process is one of the most important and necessary processing steps in sheet metal industry. This system can replace existing manual feed and operated punching and pressing machines. By interfacing PLC controls with the conventional machines, it is possible to achieve good results in the form of reduced manufacturing lead time, reduced cost and increased safety of the worker.

T Sheela. S. Shireman et. al. [5] in the paper titled “Low-Cost Automation for Sorting of Objects on Conveyor Belt”, low-cost automatic salting of a conveyor belt. While collecting objects from conveyor belt linear actuator the object once kept on the conveyor belt the assembly makes the verb of the seeking the object very efficiently

### III. METHODOLOGY

This is a system is based on automation. so there is no required of manpower for development of this system. We followed following steps for fabrication of this stamping machine

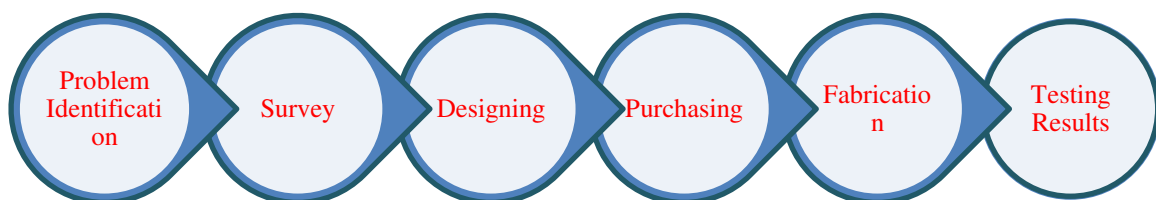


Fig.no.3.1

### IV. PRINCIPLE OF OPREATION

This stamping machine is working on Arduino circuit first of the working of the component like pneumatic cylinder, DC gear motor, 5/2 DCV, proximity sensors are controlled by Arduino Circuit so it is more reliable as their human interfere.

The main component of Arduino based stamping machine are: -

- |                                     |                                  |
|-------------------------------------|----------------------------------|
| 1. Conveyor Belt                    | 6. Self-inking stamp             |
| 2. Rollers                          | 7. 5/2 electric DCV              |
| 3. 12V DC gear Motor (16 rpm)       | 8. SMPS (12V 6A)                 |
| 4. Pneumatic Double acting Cylinder | 9. Relay channel (12V 2 channel) |
| 5. Pneumatic Pipes & Fittings       | 10. PCB Board                    |

## V. SELF PROPOSED WORK

The conveyor belt is powered with the help of the 12V DC gear motor. 2 IR proximity sensors are fixed at two different positions. When an object comes in front of sensor 1, it senses the object and sends signals to start the DC motor; it rotates the conveyor belt. As the object travels, when it comes in front of sensor 2, sensor 2 senses it and sends a signal to the Arduino circuit to stop the motor. A pneumatic double-acting cylinder is fixed on the stamping bridge. As the object comes under the cylinder, it starts actuating. A self-inking stamp is connected at the end of the cylinder piston rod. Air pressure is controlled by a 5/2 DCV. After the stamping action on the product, piston rods come to their original condition. After this, the conveyor starts again and stamped products are collected in a bucket. This process is repeated again and again.

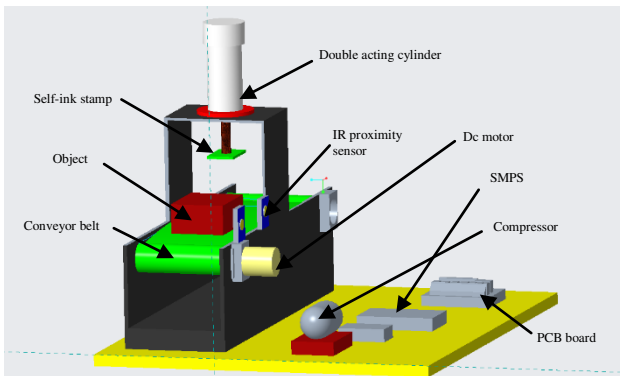


Fig.no.5.1



Fig.no.5.2

## VI. FUTURE SCOPE

This stamping system can be combined with a sorting system and a counting system. As per requirements, it can be further fabricated with more equipment. This design can be used at government offices, post offices, colleges, etc. It can be further fabricated with high speed and easy manufacturing with different mechatronics structures. It is also usable for educational purposes.

## VII. CONCLUSION

An Arduino-based stamping system mainly aims for domestic small-scale business. It can be used for stamping logos and other details like MRP, manufacturing data, expired date, batch number, etc. By the system, human energy can be saved by using automation; work is done with less time, accuracy, and efficiency. Hence, we succeeded in designing and fabricating the Arduino-based stamping machine with low cost and low time consumption with more accuracy. This system is purely based on automation.

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