

Review Research Paper on Automatic Stamping Machine Using PLC

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Abstract: This paper represents the literature review research paper on Automatic stamping machine using PLC module. The conventional method for object stamping is manual, it is very time consuming and in non-automatic form. Continuous stamping or printing results in hand fatigue requires lots of efforts and also affects the accuracy to result so the manual method must be replaced by PLC Automation. Automatic stamping of object has received significant attention because automatic stamping is reliable and reproducible. This not only reduce manual effort but also gives more time for marketing also prevent danger which might occur when human being works in hazardous environment. Automation greatly improves the profit and productivity, it is very scalable.

Keywords: Stamping Machine, PLC, Pneumatics Cylinder, Ladder Logic Programming

I. INTRODUCTION

The various modern stamping machining processes getting widely used in the industries are: Pneumatic stamping machine, PLC stamping machine, metal sheet stamping etc. Stamping is process for reproducing text or images using a master form or templates. The process of stamping was manually. It was a human based operation that consist a lot of mistakes and inaccuracy. That operation takes a lot of time and human efforts. Development in stamping machine brings that can print stamp logo on a fixed position on paper. Later development brings movable arm stamp machine. Both machines were only for single pages. The important vision of this machine is to fabricate the machine in minimum cost and profitable output. Also the machine is simple to maintain and easy to operate. In the modern fast world of new and latest technologies, everyone goes for perfection and quickness. The present practice in food packaging industries is that, stamping is manually done by operatives and may require up to seven operatives per line if one need to achieve a higher output. This single action is time consuming, generate higher expenditure and also result to poor finishing by operatives during manual stamping process to meet production target. In order to achieve higher productivity and safe tremendous cost there is need for automatic stamping if small scale industries are to remain competitive while maximizing profit.

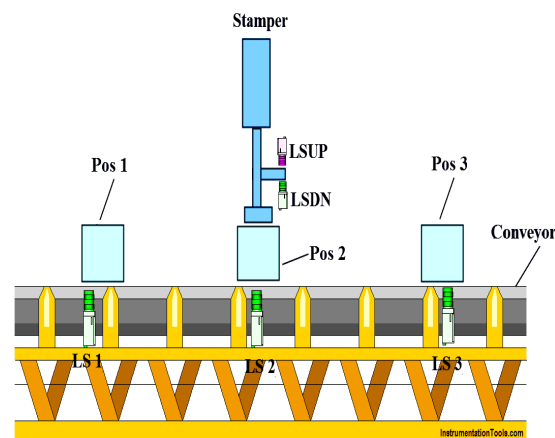


Figure 1: Prototype model of stamping machine

II. LITERATURE REVIEW

T Sheela. S .Shivraman et al [1] in the paper titled “Low Cost Automation for Sorting of Objects on Conveyor Belt”, proposed the system which describes that uses Raspberry pi 3 making the model generally sensing the color of the object is a big challenge as there is a chance of high uncertainty due to the external lighting conditions and each nose. Similarly, while collecting objects from conveyor belt by a linear actuator, there are variations in weight and size of object. Further approaches to this system can be made to increase the capability to segregate large and heavy objects and sort them effectively. The objects once kept on the conveyor belt, the further assembly makes the work of sorting the objects very efficiently. In the paper, the author shave revealed that they have proposed a system which sorts the objects based on their color which can future be enhanced to sort them based on their size and shape with the help of IR sensor of near about short range communication requirements.

Amruta Pandit, Jyoti Rangole et al [2] in the paper titled “Object Counting using Image processing techniques” which describes Image Processing techniques that are helpful for object counting and reduce the time of counting effectively. Proper Recognition of the object is important for object counting. The accuracy of the algorithm depends on camera used, size of object, whether or not objects touching and illumination conditions. Object counting using image processing system has huge applications where automation is to be introduced and time of counting is to be reduced linearly it reduces the man power required behind the counting, sorting and identification mechanism. These authors have implemented the most efficient and effective technique so as to provide the above said platform in order to achieve the tasks effectively.

Avadhoot R. Telepatil, Prashant M. Jadhav et al [3] in the paper titled “Color Object Counting and Sorting Mechanism Using I’-m-age Processing Approach” proposed that the color object counting and sorting is the major task that needs to be done at final dispatch section. Manual sorting is the tradition approach that preferred by industries. In this approach, visual inspection performed by human opera-tors. This traditional approach is time-consuming and non- consistent. Therefore the efforts are made to design and implemented the automatic technique to determine color of an object, color based object counting using image processing. In implemented system, image of a colored object which is rolling over a conveyer belt has been captured using suitable image acquisition device.

The stamping is a process for reproducing text and images using a templates. The example of the cylinder seals and objects such as Cyrus Cylinder. The printing include the movable type. The first developed by Bi Sheng in china. These is mechanical movable type printing to Europe in the 15 the century ,printing press key role in the development of the Renaissance, reformation, scientific resolution, and material basis for the modern knowledge based economy. The paper is the most common material, it is also done on metals, plastics, cloth and composite material. The printing press rapidly spread across Europe, leading up to Renaissance and later all around the world .The movable type printing have been called the most important invention of the second millennium. This is cost effective, less maintenance and gives considerable output. In this machine there are three modes of operation we have added i.e. manual mode, signal auto, continuous auto.

Mr. Ravipothina, B. Raju et al [4] in this paper titled “Automatic Pneumatic Stamping Machine” From last few years it has been seen that the pneumatic system playing very important role in industries due to its precision and cost. Mainly there is no need to be operated by skilled ones. The main advantage of this machine that it can be operated at low pressure (up to 6 bar). The quick retrieval mechanism is used in the stamping machine by action of pressurized air. Solenoid valves are used as direction control valves for operation. By replacing some attachment we can also elaborates other applications. The further objective of the system is, this is susceptible of a low cost of manufacturing with regards to both cost and labor, and which accordingly is then susceptible of low prices of sale to the public, so thereby making such automatic stamping machine are very economically to available to the public.

A Gundawar, Y Shahane et al [5] 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. The general purpose of the present invention, which will be described subsequently in greater details, is to provide a portable automatic pneumatic stamping machine which has many advantages of the low power consumption and effective performance and many specified features of the system, which is not anticipated. further objective of the system is, this is susceptible of a low cost of manufacturing with regards to both cost and labor, and which accordingly is then susceptible of low prices of sale to the public, so thereby making such automatic stamping machine are very economically to available to the public.

Mr.Arun S, Sree Rajendra and Vijayavithal Bongale[6] The proposed work describes the design and fabrication of prototype of automatic punching machine controlled by PLC and shedding light on the working principle and the hardware structure of the system. Punching or pressing process is one of the most important and necessary processing step in sheet metal industry. By automating this process one can have a greater control over the process Programmable Logic Controllers are used for the control of the system. 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.

Mr.Raj Kumar Sharma, RakeshPatwal, Rakesh Kumar Yadav, Vijay pratap[7] This project is basically an automation based control system. The project is done by integrating cam and follower driven stamping machine. This machine will run on several steps of process that is paper feeding, and stamping. The purpose of this project is to generate the correct sequence of events for a stamping machine by designing the cam and follower and by controlling the motions of cam, conveyor and printer which is used for paper feeding with the help of some circuit mechanisms such as relays, electronic timers etc. The cost of stamping paper by the machine is very less as compare to the man. Time taken by the machine to stamp is more as compare to man. Our machine can stamp only A4 sheet (It depend upon printer) but man can stamp any size of paper. Machine can work for long hours without break but man needs break. Speed of machine to stamp is constant but the speed of man is decrease with time. Our machine required electricity to operate while man doesn't. Our machine can stamp only at speci-fied position but man is flexible, so it can Stamp any position.

D.S. Welkar [8], Automatic and Pad Printing Machining is presented and analysed. In this stamping machine working on principle of Microcontroller. Using this machine we can easily print our logo or name on leather, card board, papers, and plastic articles crafts by using pad printing tool.S. M. Pimpalgaonkar [2], 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 mechanical energy by Rack & Pinion mechanism for Post Card. Using this machine for post cards faster work can be done at post office and efficient work can be performed through this machine MohdJazirin Bin Shamsul Bahrin [3] Programmable logic control application for stamping operation. This machine is done by integrating Programmable Logic Control (PLC) with Pneumatic Driven Stamping machine. The rubber stamping machine running smoothly , fast & produce high quality stamping product using PLC with desired process sequence. Mr.Ravipothina,[4] This works on automatic Pneumatic stamping machine with help of transformer, Air compressor, Solenoid switches & Microcontroller. The general purpose of this machine is to provide automatic pneumatic stamping machine with low power consumption, and effective performance. Yusha Patel,[5], It is an Arduino Controlled Paper Stamping Machine that works on an Arduino controller which controls feed and stamping mechanism of paper. On this machine different size papers can be stamped continuously & very easy to use and also it has smooth operation output.

Akshay Gundawar,[6]. The idea behind the project is to create a pneumatic stamping machine at a very low cost. For branding or stamping, logos is needed and identification of product. Create impressions on sheet metals 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. P. R Dadigamuwa,[7] Automated paper gathering and folding machine mainly consists of paper gathering, paper feeding, paper folding, and stamping mechanisms friction feed method was used to make the paper feeding mechanism in proposed machine. This automated machine is portable and capable of working independently without much human intervention also durable and is less of disruptions.

Rakesh Sehgal,[8], An attempt has been made to achieve the stamping operation by means of a mechanism which is an inversion of the well-known four bar chain mechanism with stamp, stamp pad and the conveyor belt as its limits of travel. It aspect that this paper highlights is how a whole set-up for marking, punching or stamping can be made to operate with a single drive without the need to use a separate drive for the conveyor belt. Ekta Tripathi,[9], A sorting and stamping machine have main task of sorting letters according to the pin codes. This method is highly efficient in sorting printed letters occupies very little space and is a one-time investment that provides invaluable future returns. PawanKoppa[10]. The idea behind this project is to develop atomize sequence of stamping using PLC in electro pneumatic stamping machine. An automatic stamping machine working on the principle of electro-pneumatics and PLC was successfully designed and developed.

III. CONCLUSION

In this paper we conclude that “Automatic stamping machine using PLC” It is the reliable printing mechanism this replaces traditional hand stamping on any object. The general purpose of the present invention, which will be described subsequently in greater details, is to provide a portable automatic pneumatic stamping machine which has many advantages of the low power consumption effective performance and many specified features of the system

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