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Pic Microcontroller Based Automatic Stamping Machine

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ABSTRACT

This paper proposes the design of PIC Microcontroller based Automatic Stamping machine. In stamping industry & printing industry stamping machine is one of the standard machines. It is mainly used to trample the emblem or any other secret code. This automatic Stamping machine is useful in academic institutions, administration offices, Post offices, finance department etc. A roller mechanism is used for the feed of the paper and the stamping will be done by including a simple link mechanism. The structure can easily be simplified by using crank shaft and screw rod mechanism.

Keywords : PIC Microcontroller, Stamping Machine, Roller Mechanism, Crank Shaft, Screw Rod Mechanism

I. INTRODUCTION

The sheet metal parts is already been replaced by many expensive cast, forged, and machined products in this thrifty global market. The motive is clearly the relative market of operation, simpler accomplishment for mass- production, as well as superior control on the technological parameters. Punching or pressing operation is the key or preliminary operation in the process sequence in most of the sheet metal operations. Automating this process results in reduced lead time and also can reduce human effort. Automation can be defined as the "technology concerned with application of mechanical, electronic and computer-based systems to operate and control production". There are many reasons for automating the process. The reason maybe to reduce mechanized lead time, to increase labor productivity or to improve the employee safety. etc.

In order to lower the necessity for man power in the production of supplies and services, the role of Automation is the only solution in the use of control systems and information technologies. In the scope of industrialization, automation is a step beyond mechanization. Automation plays an progressively more significant role in the global market and in day to day practice. In today's world of automation everything is done at higher accuracies and precision. Industry today made improvisation in existing methods Stamping is one of the processes which are performed manually. It requires inking and pressure on pad so as to achieve impression exact being stamped in the required specification. The aim of this paper is to show a low-cost demonstration of what actually happens in the industry. A Microcontroller is used for automation of electromechanical processes, such as control of machinery on factory assembly lines, amusement rides, or lighting fixtures. Microcontroller is used for achieving precise control over the stamping process.

The Pneumatic stamping machine, PLC stamping machine, metal sheet stamping etc. are the various modern stamping machining processes getting widely used in the industries. Stamping is process for producing a copy of text or descriptions using a template or master form. Still now, the process of stamping is done in manual way. A lot of mistakes and inaccuracy is involved in human based operation. This process takes more amount of time and human pains. Initially the stamping machine was designed that can print stamp logo on a fixed position on paper. Later on, expansion brings variable arm stamp machine. These machines were only for single pages. This type of machine contains fault while operating and also time consuming. This paved the way to the design of an automatic stamping machine for multi pages. The vital vision of this machine is to manufacture the mechanism in lowest amount and gainful output. The machine is also easy to preserve and simple to work. With the help of this automatic stamping machine it is effortless to print the symbol, name, sticker on vacant paper, metal and leather. This project mainly aims at printing on paper as it is the most common material. But it can also be done on cloth, plastics, metals and amalgamated materials.

II. LITERATURE SURVEY

The manual paper adjustment tray is used to fix the stamping area of the paper which is to be stamped on a particular position.

It works on the principle of screw rod mechanism. After the stamping position is fixed the paper is stamped automatically by the machine through crank shaft mechanism and counted.

The paper is automatically rolled out by using roller mechanism after the stamping process is completed.

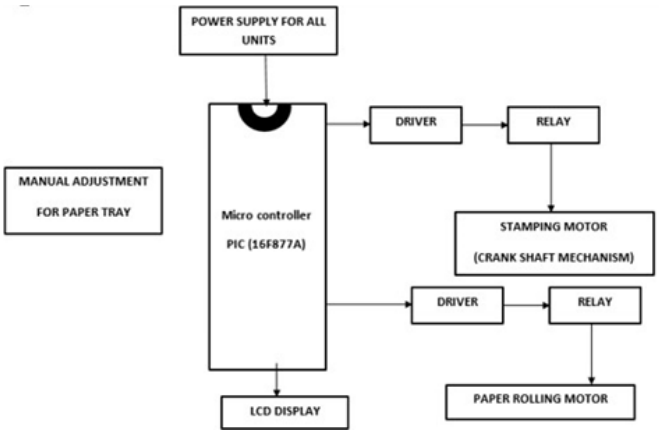

Figure 1. Block diagram of Automatic Stamping Machine

III. EXISTING SYSTEM

The existing system of stamping process is to be done by humans manually. It increases the stamping time and the stamping cannot be done at the correct position all the time. It results in fatigue operations. The main disadvantages of the existing system are the position of the stamp and it takes much more time for the stamping of papers who are having same position to be stamped.

IV. PROPOSED SYSTEM

By overcoming the disadvantages of the existing system proposed system is designed. A large number of papers can be stamped together and counted using the proposed system. A roller mechanism is used for the paper feed arrangement. The stamping area of the paper is to be set by the screw rod mechanism. A trouble-free crank shaft mechanism is used for stamping purpose. After the stamping process the paper will come out by using roller mechanism.

V. RESULTS AND DISCUSSION

The following figures represents the working model of automatic stamping machine and the stamping process. The paper stamping can be done at four corners namely

1. Top left corner
2. Top right corner
3. Bottom left corner
4. Bottom right corner

Also the paper count can be indicated by using an LCD display. The advantages are as follows.

1. Reduces the man power
2. Easy to operate
3. Automatic paper counting system
4. Flexible
5. No need to adjust the papers.

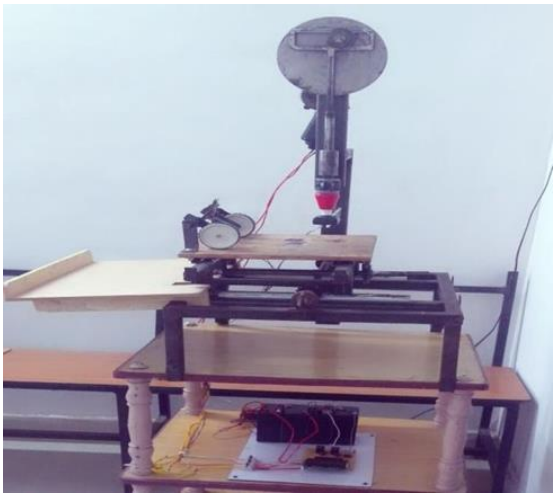

Figure 2. Working Model of the proposed system

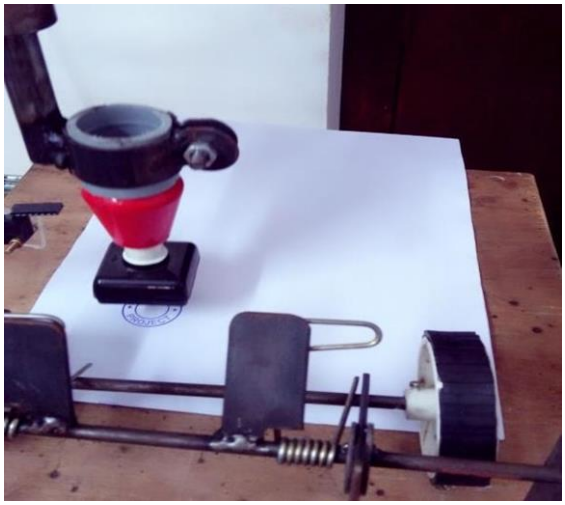

Figure 3. Stamping Process

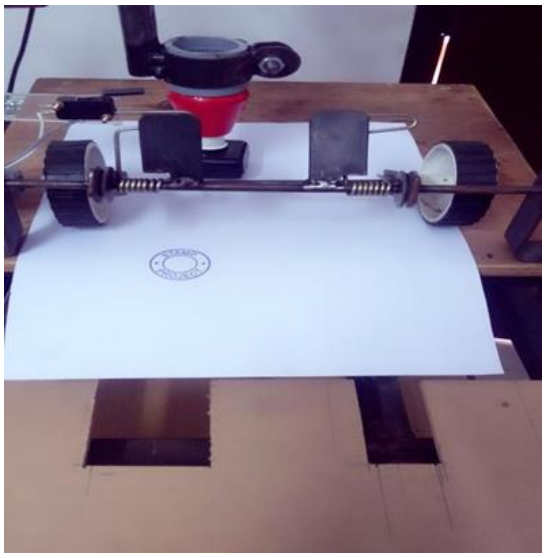

Figure 4. Stamping of Paper at Top Left Side

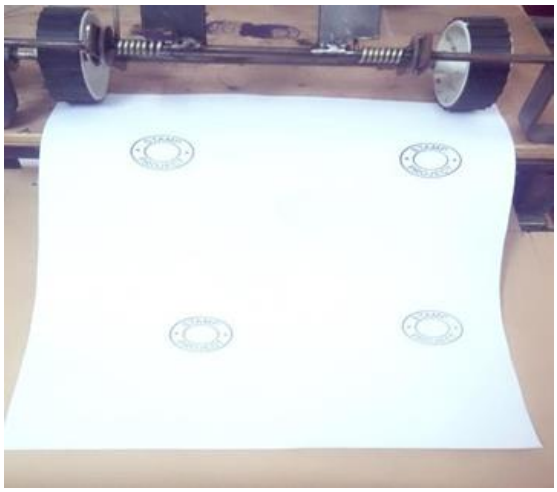

Figure 5. Stamping of Paper at all the Four Corners

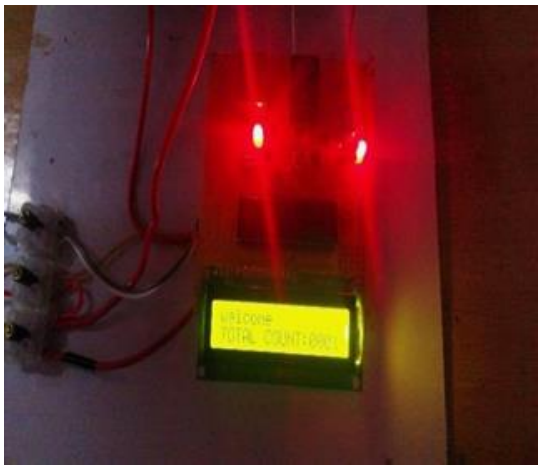

Figure 6. LCD Display of paper count

VI.CONCLUSION

It is clear from the above results that the designed machine can stamp a greater number of papers in a given time as compared to manual work. Also, the

stamping position on the paper can be adjusted according to our needs. The machine works at a constant speed as designed in the program unit of Arduino controller. The speed can be increased or decreased by slight modification in the design procedure. At present, the machine is designed to stamp A4 sheet which in future can be designed to stamp any sized paper. The machine can be solar powered so as to minimize the electricity cost. This plan can be used at academic institutions, Administrative offices, finance sections etc.

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