

DESIGN AND FABRICATION OF OUTER THREAD CUTTING MACHINE

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ABSTRACT

Now a days glasses are cutting manually or CNC automatic programming. But the manually operation is the very dangerous, because the dimension or marking will change due to wrong alignment or sense of sight and operator's error. So we require the skilled labour. So our project deals how to reduce the labour cost and how to increase the accuracy of the cutting. But in the automatic CNC machine the above difficulties are not induced. But the cost of CNC machine is high. So we can use the "DESIGN AND FABRICATION OF OUTER THREAD CUTTING MACHINE". It is very accurate cutting in taper angles and also the straight line, square or rectangular cutting. In future we can produce it for fully automatic and also rotary motion. Day by day, the requirement of the finished goods is increased tremendously in the market, so that to meet the requirement of goods the industry has required adopting the automation. Automation plays a major role in the development of the nation. In this paper the conventional threading machine is modified by reducing the manual handling time by means of automation as well as reduces the consumption of coolant oil by design of radiator. To make automation in thread rolling machine with lesser cost for minimization of worker involvement to reduce labor cost and increase the productivity.

I.INTRODUCTION

Now a days the glass manufacturing & cutting Technology are well developed. But this technology & development is only useful to the large scale industries. Because of high investment on CNC machine. Small Scale Industries cannot afford for CNC machines, they utilize human labour for glass cutting, marking, etc. And so the small scale industries depend on the labour for their cutting work. Due to this manual work Now a day in many industries production of threaded bars by using manual operated threading machines so it required more time and lower efficiency of machine. In order to reduce time and labor costs, we design circuit for automation in threading machine.

In today's competitive global economy, manufacturers are experiencing more pressure than ever to automate their production processes. As a result, designers of automation systems face many challenges during system development, some with far reaching consequences that may not initially be realized. The aim of this project is to evaluate these design decisions and present them in a general way which can be applied to other systems and applications. Specifically this project addresses the design of an automatic loading and unloading system for a thread rolling machine, used in producing threaded bars. The design of any Automation system should begin on the macro scale. Issues such as the system's role in the overall manufacturing process and material flow through the plant should be addressed before considering any specific mechanical designs.

II. LITERATURE SURVEY

M.Muthukkaruppan & K. Manoj, 24TH international symposium automation & robotics in construction, is arc. Low cost automation using electro pneumatic system-an online case study in multistation part transfer, drilling& tapping machine case study & comparison of productivity of a component using real time multi-stationed automated rotary transfer line used for drilling, tapping.

Sameer chowdhary, o. Burak ozdoganlar, shiv g. Kapoor, richard e. Devor, university of illinois at urbana-champaign, urbana, il 61801, usa modeling and analysis of internal thread forming this paper presents a mechanistic model for the prediction of thrust and torque experienced by a forming tap during an internal thread forming process.

Darshith, Ramesh Babu & Manjunaths.-iosr journal of mechanical and civil engineering (IOSR-JMCE) .this paper deals with the thread cutting and thread rolling process for special threads. The various methods of thread cutting and thread rolling process are discussed.

Wagner Matthew - Aerospace fastener production contains many machining and forming operations, such as heading, centerless grinding and thread rolling. Typically many of these processes have been hand fed, especially for large diameter parts. This project presents a general automation plan, based on the concept of a workcell, by which large diameter fastener production processes can be automated. Specifically, an automatic loading and unloading system for a thread rolling machine is developed and prototyped to prove the overall workcell concept.

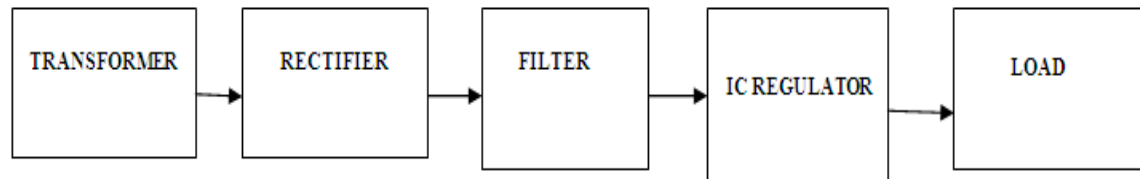
III.METHODOLOGY

When shaft is inserted in the dies , the proximity sensor places in dies gets signal and gives signal to a sensor unit then sensor unit gives signal to a contactor 1,the contactor unit actuated and transfer unit to main switch to solenoid valve which operated the direction control valve. Then control valves flow current from main switch to electric motor .electric motor rotates and material or rod allow air to pass from compressor to actuator which is pneumatic cylinder and reverse stroke is caused .at that time signal is goes to timer and timer givens signal to contactor 2. Contactor 2 allows from platform comes on the control line at the same time timer gives signal to contactor 1 and allows current flow towards solenoid valve and solenoid actuates and pressurized air applies force on the piston and forward stroke is occurred .again the material is passes to the dies and same process is carried out again.

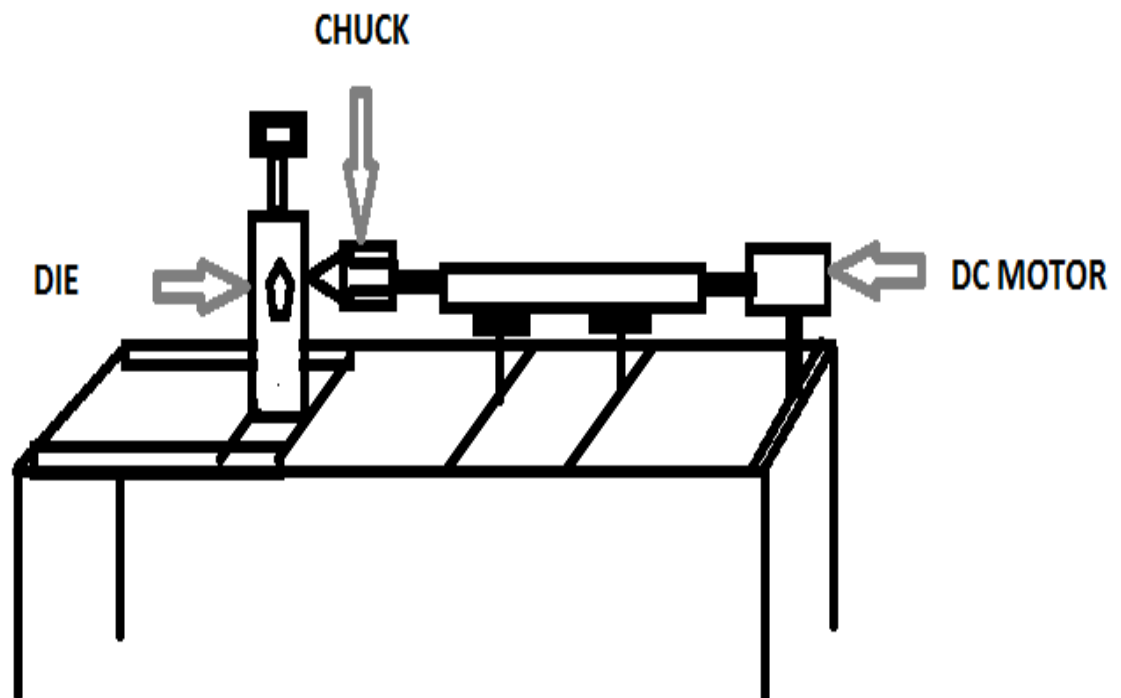
BLOCK DIAGRAM

The AC voltage, typically 220V RMS, is connected to a transformer, which steps that AC voltage down to the level of the desired DC output. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a DC voltage. This resulting DC voltage usually has some ripple or AC voltage variation.

A regulator circuit removes the ripples and also remains the same DC value even if the input DC voltage varies, or the load connected to the output DC voltage changes. This voltage regulation is usually obtained using one of the popular voltage regulator IC units.



:Block Diagram of Power Supply



IV. RESULT AND DISCUSSION

Since thread production with rolling method is being a plastic deformation, the displaced/deformed raw material with rolling roller is formed coincide with to matrix shape. In this study internal thread rolling process was carried out by internal thread rolling head developed and manufactured. Three number of roller made of HSS (M42) was used in order to reduce friction forces and to achieve a good surface quality during deformation. During rolling of roller on raw material, the material has not only taken thread form but also caused hardening of flank surface depends on cold deformation. The screw thread as a result of tensile force acting its flank surfaces is started to squeeze and the tensile force is increased till the maximum squeezing limit of first thread, following the destroying of first thread the other threads subjected to squeezing continuously while the tensile force is reduced. The damage formation till to be drawn of the thread can be expressed as end failure. It is shown that the tensile test graph, the section picture of the drawn thread, the SEM view, the view of the threads squeezed and directed towards to drawing direction on optical projector are in Fig. 8a-c, respectively for the thread of M12x1.75 made cutting tap. In order to oppose destroying of the matrix during tensile testing the bolt made of chrome-nickel was used for each experiment. It was observed that not only the samples threads are deformed but also drawing bolt and matrix as well. When SEM view of thread made with cutting tap is investigated it is seen tears and burrs on thread flanks depend on cutting, these increase the notching effect and cause to breaking off the thread in addition to drawing off.

V .APPLICATION

- It can be use in any industry.
- It can be used for interior & decoration works.

VI .ADVANTAGES

- Accurate cutting compare to hand cutting
- We can produce the taper lines for required angle
- Not need of skilled labour
- Low cost compare to CNC machine
- Cut the rectangular or square glass pieces

VII .LIMITATIONS

- The maximum size of the glass to be hold is 280x280 mm (Square)
- The minimum size of the glass to be hold is 180x180 mm (Square)
- The thickness of cut can be obtained within 2-20 mm

VIII .CONCLUSIONS

In automation on threading machine, a human work is replaced by installing automation on thread rolling machine. This entire unit along with framework is mounted adjacent to the existing thread rolling machine effectively. Designed system was tested by working of threading machine using automation to find actual productivity. The time for one job to thread is 6 min. From results, it can be conducted that the elimination of the human work i.e. worker helps in reduction of labor cost. Thus the system is reliable enough to produce threaded jobs by elimination of labor cost and increased productivity. However further improvement in job supporting arrangements is required to avoid jerk of the job during loading.

IX.REFERENCES

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