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Design and Development of Heat Treatment Based D-cut Machine for Packaging Industries.

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Abstract: The market demand of the packaging products is a growing market in India. One of the products in the packaging is widely used knows as bags. These bags are used widely in the agricultural and food products. One of the processes which are necessary in the production of the pp woven bags is to cut their handle. There are so many types of punching machines available in the market based on the air compressor and hydraulics. Need of extra equipment with the machine increases its cost and thereby production costs. In the mission of make in India we are using such Chinese machines. Promotion is made in India is the top priority in this project.

Keyword - Packaging Industry, Productivity,Time

I. INTRODUCTION

Manual cutting of pp bags and bubble in large quantity consumes time and energy. Also there is no any cutting accuracy in manual process. Polypropylene and Bubble wrap for packing is a great and useful material that is typically used for protection purposes while you move home. It is cheap to buy and easily accessible online and is well worth the trouble to ensure that your household possessions are completely safe from harm.Here is a solution to develop a low-cost heat treatment based portable machine to cut the small pieces of bubble wrap from the big rolls. This machine will also applicable for the woven bags cutting in the very precise manners. This is some kind of products which are manufactured or used in very large quantity and costs very less. Therefore, it is inconvenient to use a specific cutting assembly line or manual labors for this kind of assistive work creates problems. Our machine will be helpful to cut this packaging machine with precise dimensions and by using only one operator and at higher speeds.

II. PROBLEM STATMENT

1) Made in china machine
2) High Cost of the machine – 2.5Lack – 4 Lack
3) Needs external compressors and consumes more electricity
4) Needs two operators/Workers

III. OBJECTIVE

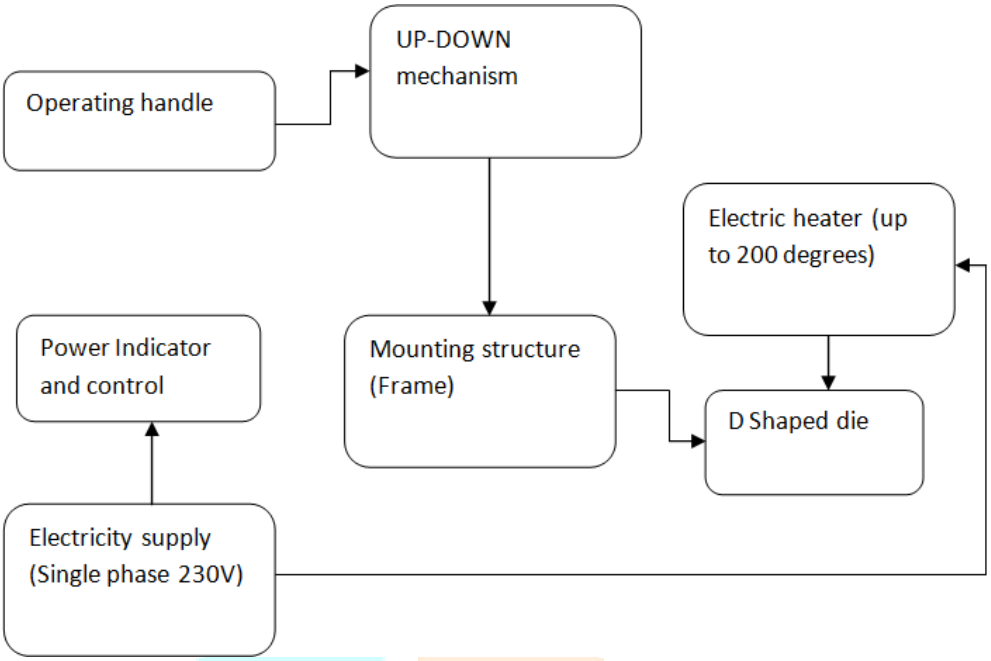
1) Make in India product/technology.
2) Only one operator for machine operation.
3) Low cost machine.
4) Small compact size of the machine.
5) Ease of transportation.
6) Higher productivity.

IV. METHODOLOGY

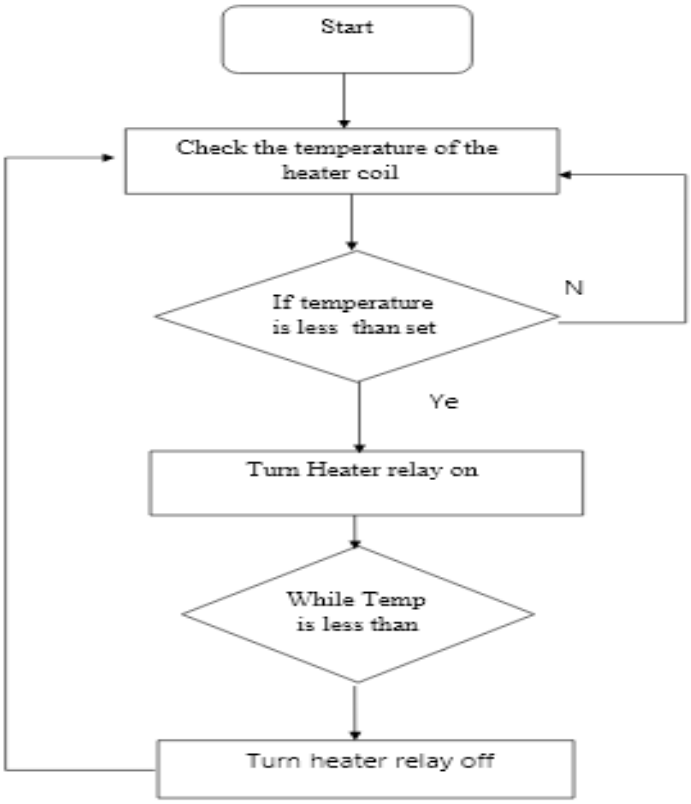
In our project we will be developing a innovative heat treatment based punching machines for same purpose of packaging industries. Heat treatment will be able to cut and penetrate the bags easily. Additionally this heat will seal the cutting edges properly. It will make the cut stronger to carry the bag and material weight. This make in India technology will need only one labor to operate the machine which will help to reduce the productivity cost and expenses. Small and compact size will make machine transportation and installation easier. Quick and higher productivity of our innovative D Cut machine will make is extremely beneficial in the woven bag industries.

1.1METHOD OF IMPLEMENTATION

1)Block diagram



1.2 FLOWCHART



1.3 list of material

Sr. No.	Name of the material	Specifications of the materials	Cost
1	MS channels	20*20*1.5 mm square channels 20 feet	800
2	MS Rod	40mm diameter 2 mm thickness	200
3	Heater holder	MS Springs with M5 Nut bolts	400
4	Nichrome wire heater	22 SWG, 4 Feet	300
5	Power supply	12Vtransformer,5 amp	400
6	Power supply cable	3 meter, 2 pin mains cord	60
7	MaZins cord	1.5Sq.mm	80
8	MCB	6amp single pole MCB	400

Table 1. List of materials

2.1Problem In Manual Operation

When manufacturing engineers are tasked with automating a process that is currently done manually, their main question for an automation supplier is, “Have you ever automated this specific process before?”

In complex applications, the answer is typically, “no.” Even simple applications can be more complex than at first glance. Most applications are unique. There is no one overarching solution for any given application process, and it is crucial to understand exactly what the customer is looking for and cater the solution to their needs.

As a result, we begin the automation process by trying to understand the needs of the customer. Sometimes, this can be accomplished with standalone components that the manufacturing engineers can implement themselves. In complicated processes, outsourcing to automation suppliers to design and build a turnkey system may be more realistic. In still other cases, there could be some middle ground between these two paths

2.2Project Assmebly

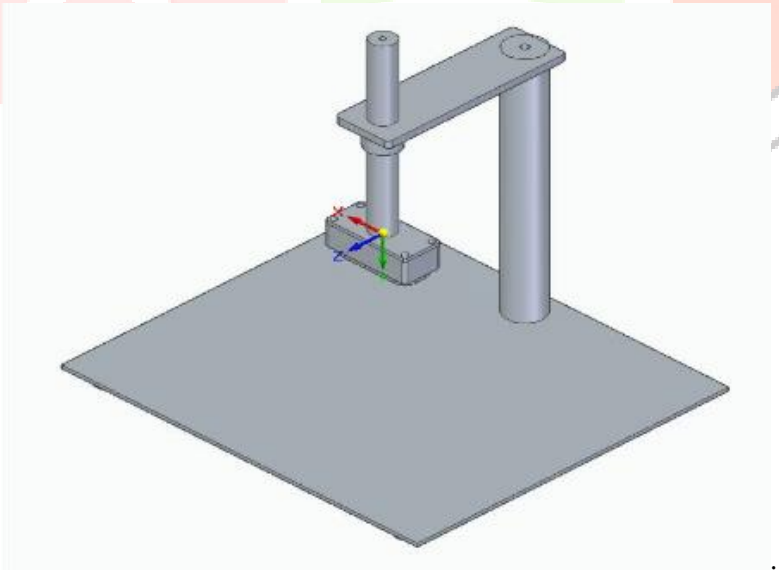


fig.Project Assmebly

3. Advantages

•Highly productivity
•Only one operator can handle assembly
•Works on single phase 230v ac supply
•Light weight frame
•Can be easily located anywhere
•Comes with long extension cord
•Fast and semiautomatic operation
•Quick starting
•Energy efficient
•Can be used to for cutting of ay king of stretch wrapping materials
•Adjustable heater settings for setting cut piece dimensions
•Scale arrangement for accurate cuttings.

4.Limitation

•There are no any critical limitation of this project except electricity cut.
•Electricity cut can affect the production through the machine. This problem can be solved by implementing UPS Backup systems in plant

5.Conclusion

This machine will be an extremely day to day useful machine for all things of packaging operations. This machine is beneficial in terms of increased productivity and reduced cost of resources such as manpower and time and money saving. Also, the cut pieces produced will be more precise and accurate to the dimensions as per the product requirements. This energy and cost-effective cutting machine will be applicable at variety of applications and make use of proper resources. This technology will help packaging industries..

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