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## MECHANICAL OPERATED AUTOMATION SYSTEM

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### ABSTRACT

*This Paper objective is to know the actual working of the Automation system. A mechanism for automatically pushing up tissues which includes a box and a pusher. The box stores a tissues in layers and has top wall with an opening formed therein for picking up tissues their through, the pusher disposed under the tissues in the box for pushing up tissues.*

*In this working model, we have made the actual working or simulation of automation system so that it is easy to understand. Our main goal is to make a study model of punching, stamping and power transmission in automation system. With actual working of it only placing all the component in its proper positioning and simplifying the working of it for studying purpose of student it is exactly similar to that of the actual automation system used in industries.*

### KEYWORDS:

**Synchronous Motor, Reduction Unit (Gear), Spur Gear Half, Indexing Mechanism, Geneva Mechanism.**

### INTRODUCTION:

Now days, there is lot of competition in the market. So there is need of developing a new method or process for effective manufacturing. That process or methods should fulfill the requirement about accuracy Productivity etc.

It is necessary to reduce the total matching time. There are various Ways by which the total matching time can be effectively minimized. There are various time consuming steps or sub process, which can be, minimize by various methods. In mass production the time criteria is very important. Within small time limit, a single unit job has to be completed. For minimizing the job time, the handling of the job should be minimum. So that labor time considerably saved. Form minimizing the handling time; we introduce the attachment for stamping and punching as well as milling machine for the operation. Suppose for one job B, there are number of sequential operation such as stamping and punching reaming that can be effectively perform by one after another with greater accuracy & at faster rate. For stamping and punching on table head is using hand process, but by this attachment, there is only first initial making is required. Then automatically equipped stamping and punching machine. This attachment is very useful for small-scale industry as well as workshop.

## 2.1 LITERATURE REVIEW:

1. Analysis & Prospects of Modification in Belt Conveyer by Devendra Kumar R.K. Mandloi (International Journal of Engineering & Research & Application).

Now A days belt conveyer system not only used in mining, power plant, food industries etc. So it is essential equipment for in house material transformation. According to the review, belt conveyer is essential equipment for transporting material from one point to other unloading point. The parameters which impact on design of conveyer system are drum and belt design, drive mechanism fire and safety control, operation and maintenance, dust essential control inspection and efficiency controls.

2. An Improve Indexing Mechanism to Index Web Documents by pooja mougdil, A.k.Sharma, Pooja Gupta.

Owing to the dynamic nature of the web, it is difficult to search engine to find the relevant document to serve a query. For this purpose search engine maintains the index of downloaded documents stored in the local repository. An implemented indexing mechanism to store the keywords present in document with their contexture senses it also focus the importance of keywords in different html tag. The mechanism removes the stop words, stems the keyword and after that creates the index.

3. Mechanically Operated Automation System by Shinde Tushar, Bhalerao Ganesh, Amita Hase by SVCET, Rajuri.

In this working model, we have made the actual working or simulation of automation system so that

it is easy to understand. Our main goal is to make a study of model punching, stamping and power transmission in automation system. Although the design criterion imposed challenging problems which however were welcome by us due to availability of good reference book. we are therefore, happy to state

that the inclusion of mechanical aptitude proved to be a very useful purpose.

4. Study and Analysis of Roller Conveyer System In Perspective Of material Optimization by Imran Khan, Ravindra Gandhi by Abha Gaikwadpatil of engineering Nagpur.

In industries it is necessary to move a component from one area to another area in a regular basis. So it is minimized the workers in it so here we have to designed a conveyer which can be used in industries. While using carbon fiber weight of the conveyer roller is reduced by 22.58%. Hence it is conclude that carbon fiber material is suitable for the belt conveyer.

## 2.2 LIST OF COMPONENTS:

- 1) Main base
- 2) Geneva wheel
- 3) Geneva shaft
- 4) Crank shaft
- 5) Crank
- 6) Movable table
- 7) Synchronous motor
- 8) Spur gear half
- 9) Spur gear

## 2.3 METHODOLOGY:

For this problem our design project is used known as Mechanically Operated Automation System. In it we used the attachment for the stamping and

punching machine. Rotary indexing“ for stamping and punching machine to overcome said errors in conventional machines.

In this, is try to implement “Geneva wheel machine” which gives higher accuracy.Using this attachment, it will be able stamping one by one simultaneously with certain time delay in between the stamping and punching operation with small angle of twist (0) and equispaced.

“This is specially the need of manufacturing firms for mass production.”

### 2.3.1 GENEVA MECHANISM

There are many instances where it is necessary to convert continuous rotary motion into intermittent rotary motion. Such motion requirements generally exist in machine tools where spindle, turret or worktable is to be indexed. The motion picture projector also demands intermittent motion to advance the film intermittently. Geneva wheel or is one of the mechanism, which generate intermittent motion. This mechanism was originally developed as check to prevent overwinding of watches

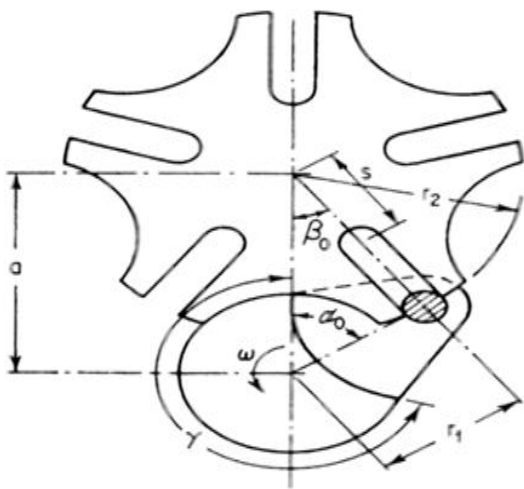
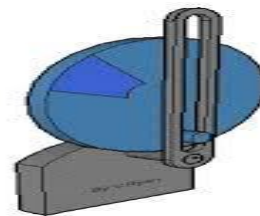


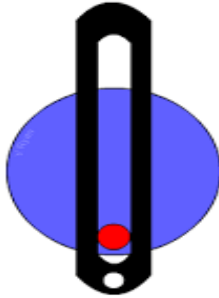
Fig.1: Geneva wheel mechanism

Figure shows Geneva wheel it is provided with four slot. The crank, which usually rotates at uniform velocity, carries a roller that engages with slots of Geneva wheel. Notice that the center lines of the slots and cranks are manually operated particularly when the roller and slot engage or disengage during one rotation of crank. The Geneva wheel rotates the fractional part of rotation depending upon the number of slots. It is necessary to provide the locking device, which will not allow the Geneva wheel to rotate when the roller is not engagement. This locking device has a generally circular segment, this locking device has a generally circular segment attached to the crank as shown in figure. These locking devices also position the Geneva wheel for correct engagement of the roller with the next slot. The Geneva wheel typically has three to eighteen slots.

### 2.3.2 QUICK RETURN CRANK MECHANISM

A mechanism is mostly used in machine equipment; it generated from the linkage arrangement in such a passion by which desired output for the given input can derived, Quick return mechanism is six-bar mechanism in which time of return stroke is comparatively smaller than the time of cutting stroke so it is called quick return mechanism For complete understanding of any mechanism kinematic and dynamic analysis play significant role, kinematic analysis gives the position, velocity and acceleration of each link.





**Fig.2:** Quick return mechanism

### 3. WORKING:

The synchronous motor transmits power to the gear at 60 rpm. This gear is mounted on same shaft of the motor. This gear is engaged with another gear having more number of teeth.

These gears works as reduction unit. It reduces rpm of the motor from 60 to 6rpm.As a result the Geneva wheel moves with the speed of 6 rpm. As the movable table and the Geneva wheel are mounted on the same shaft, the movable table also rotates with the speed of 6rpm.

The movable table contains 6 slots for the placement of tables. When the crank engages with Geneva wheel, the table slot shifts from one position to other position. This time period is known as „Indexing time“. In this time period limit switch is in off position and it does not allow the stamping.

### 4. ADVANTAGE & DISADVANTAGE-

#### 4.1 ADVANTAGES:

1. It minimizes the jobs handling time of ideal time.
2. It minimizes the man power requirement.
3. Cost of this attachment is comparatively less.
4. It increases the efficiency of machine & productivity

5. It's maintenance is low
6. It's accuracy and repeatability is highly effective
7. It is effectively used on table packet or any cartons.

#### 4.2 DISADVANTAGES:

1. The proper clamping arrangement should be required for clamping the job.
2. There is restriction in number of intermediate motion because number of motion depends upon number of slots on Geneva driver wheel, number of slots maximum can be possible eighteen.

#### 4.3 APPLICATION:

- PUNCHING:-The punching operation is similar to piercing operation. While punching the formation of hole is desired.
- BLANKING:-The blanking is the operation of cutting of flat sheet to the desired shapes. The material punched out is the required product and the plate with hole left on the die goes to waste.
- BENDING:-It refer to more plain bends, weather curved or shaped corners.
- EMBOSSING: -It means the forming of shapes such as letters or fancy design on fairly then material where there is design on both sides.



## RESULT AND DISCUSSION:

Although the design criterion imposed challenging problems which however were welcome by us due to availability of good reference books. The selection of choice of raw materials helped us in machining of the various components to very close tolerances and thereby minimizing the level of wear and tear.

The design of control architecture was an important aspect of study because a strong interaction between the many different parts was needed. So we are satisfied with our project.

## CONCLUSION:

While concluding this part, we feel quite contented in having completed the project assignment well on time. We had enormous practical experience on the manufacturing schedules of the working project model. We are therefore, happy to state that the inculcation of mechanical aptitude proved to be a very useful purpose. We are as such overwhelmingly elated in the arriving at the targeted mission.

Undoubtedly the joint venture has had all the merits of interest and zeal shown by all of us the

credit goes to the healthy co-ordination of our batch colleague in bringing out a resourceful fulfillment of our assignment.

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