

Mini Convyor Using Geneva Mechanism

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ABSTRACT:

The Geneva mechanism is a gear mechanism that translates a continuous rotation into an intermittent rotary motion. The rotating drive wheel has a pin that reaches into a lot of the driven wheel advancing it by one step. The drive wheel also has a raised circular blocking disc that locks the driven wheel in position between steps. Geneva mechanism has many applications such as in watches, projector, etc. But we used Geneva mechanism for converting rotary motion into an intermittent motion in production line. Geneva mechanism can be used in material handling in an industry. The proposed concept will help in production line where many workers are used for the material handling purpose it also reduces the cost and threshing time requirement of a greater number of workers will be completely eliminated as only two workers can carried out the complete operation. Generally, a belt conveyor consists of a motor to drive the rollers and in our project a handle is attached to driving wheel. By using hand, we operate the driving wheel.

Keywords:-Geneva Mechanism Conveyor Analysis Quality Machine

I. INTRODUCTION

The Geneva mechanism is a gear mechanism that translates a continuous rotation into an intermittent rotary motion. The rotating drive wheel has a pin that reaches into allot of the driven wheel advancing it by one step. The drive wheel also has a raised circular blocking disc that locks the driven wheel in position between steps. Geneva mechanism has many applications such as in watches, projector, etc. Bute used Geneva mechanism for converting rotary motion into an intermittent motion in production line. Geneva mechanism can be used in material handling in an industry. The proposed concept will help in production line where many

workers are used for the material handling purpose it also reduce the cost and threshing time requirement of more number of worker will be completely eliminated as only two workers can carried out the complete operation.:

- External Geneva,
- Internal Geneva,
- Spherical Geneva
- BELT CONVEYOR
- CONVEYOR SYSTEMS
- Driving wheel
- Driven wheel
- Conveyor belt
- Rollers
- Bearings
- Shaft
- Stand

II. LITERATURE REVIEW

(1) P.KaliSindhur, this is to design a mechanism for cutting by giving intermittent feed. This intermittent feed is given by continuous revolving of circular disk in Geneva mechanism. We have designed a belt drive with the help of Geneva mechanism is used for giving feed and gives smooth operation and movement of the feed at required time interval. The feed from Geneva drive was cut by using slotted lever mechanism. It was designed using slider crank mechanism. It is placed at right angles at the end of the Geneva mechanism and overall analysis are calculated at each link.

(2) Han Jigging Yu Kang, for both inner and outer Geneva mechanism, the kinematics coefficient of the Geneva mechanism is a stable if the groove number of the Geneva wheel is a constant. The elliptic crank using as the drive crank of the Geneva wheel is equal to the mechanism which has a variable length and speed along the elliptical moving crank.

Therefore the kinematics coefficient of the Geneva mechanism is able to be changed. In this paper the analysis method of the combined Geneva mechanism is presented. The combined Geneva mechanism is put forward based upon the kinematics coefficients. The calculation method of the extreme kinematics coefficient is proposed. In the end, the design example is given.

David B Downer, This is about kinematic study of a mechanism incorporating a Geneva wheel and a gear train to achieve intermittent motion. The goal of this mechanism is to eradicate the acceleration jump at the beginning and end of the Geneva wheel motion. An epitrochoidal path replaces the circular path for the driving pin in a classical Geneva wheel drive. The epitrochoidal path is generated using a gear train and results in zero velocity, acceleration, and jerk at the beginning and end of the Geneva wheel motion. Presented a comparison of the position, velocity, acceleration, and jerk between the classical Geneva wheel mechanism and the proposed mechanism. Subsequently, the motion of the Geneva wheel is modified by introducing a non-circular gear pair to alter the timing of the epitrochoidal path. The motion of the non-circular gear pair is determined by dropping the extreme jerk of the Geneva wheel.

Brown, S.C. Large, outdoor Belt Conveyor Systems for mass materials are major sources of industrial noise and often become an environmental emissions problem for many existing and proposed plants. Deficiency in the industry's understanding of the complex, underlying conveyor noise generation mechanisms has meant there are relatively few practical and cost-effective noise management strategies. Alternatively, pressure from regulators and the community generally has often led to impossible conveyor noise specifications. This paper presents the results of an innovative program of research and testing of conveyors and components. Conveyor noise is shown to be a composite of noise generating mechanisms, the most leading of which is the dynamic interaction at the belt/idler roll interface.

Karkalla Naga Sri Anent, Belt conveyor is the moving of material from one location to another. Belt conveyor has high weight carrying capacity, huge length of conveying path, easy design and maintenance and high reliability of operation. Belt Conveyor system is also used in material movement in foundry shop like delivery and distribution of molding sand, molds and elimination of waste. This paper is to design the conveyor system used for which include belt speed, belt width, motor selection, belt specification, shaft diameter, pulley, gear box selection, with the help of standard model calculation.

III. BRIEF DESCRIPTION ABOUT MINI CONVEYOR USING GENEVA MECHANISM

1. Fabrication

Fabrication is a process of doing a work by using the different operations, such as welding, grinding, drilling and etc. The operations which are used in fabrication of our project are explained below. In the fabrication of this project a long square pipe is used for making stand and by using the gas cutting the square pipe is cut with required dimensions. These square mild steel pipes are welded together to get the stand with required dimensions. The bearings are fixed to stand by using bolts and nuts. A hand drilling machine is used to make holes on the stand with required dimensions. Then the bolts and nuts are tightened.

WELDING

Welding is a fabrication process that joins materials, usually metals or thermoplastics, by causing fusion, which is distinct from lower temperature metal-joining techniques such as brazing and soldering, which do not melt the base metal. In addition to melting the base metal, a filler material is typically added to the joint to form a pool of molten material that cools to form a joint that is usually stronger than the base material.

GAS CUTTING

Apart from using hacksaw, power saw, chisels, etc. for metal cutting operation, gas cutting is extensively used now-a-days in industry. The process consists of preheating the metal to be cut to its ignition temperature. The preheating is done by oxy-acetylene gas flame, which is supplied from surrounding openings of the cutting torch.



DRILLING

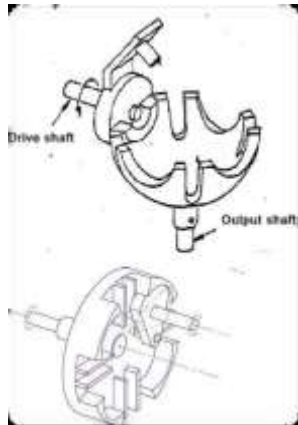
Drilling is a cutting process that uses a drill bit to cut a hole of circular cross-section in solid materials. The drill bit is usually a rotary cutting tool and it has multipoint cutting edges. The bit is pressed against the work piece and rotated at rates from

hundredsto thousands of revolutions per minute. This process is used for making holes onmaterials. The figure 5.3 shows the drilling operation

GRINDING

Grinding is an abrasive machining process that uses a grinding wheel as thecutting tool. The grinding wheel consists of a small abrasive particles which have thesharp cutting edges. This process is used to obtain fine surface finish. In grinding thematerial is removed by means of large number of cutting tools constituted by projectedabrasive particles. The figure 5.4 shows the grinding operation

IV. EXPERIMENTAL AND CONSTRUCTIONAL DETAILS OF THE SETUP



• Components:

The main component of the experimental setup and the constructional detail of the setup are described below:

1. Driving wheel
2. Driven wheel
3. Conveyor belt
4. Rollers
5. Bearings
6. Shaft
7. Stand

V. RESULT, CONCLUSION AND FUTURE SCOPE

The design and fabrication of the Geneva operated belt conveyor is completedwithin the limited time and the results obtained from this project is good. Due to the decrease in dimensions the result obtain is little bit less than expected. But the working is in proper condition. The Geneva drive pin is smoothly inserts on to the Geneva drivenslot, due to this the working is done properly.

2 Conclusion

We have successfully calculated the angular velocity and acceleration of theGeneva wheel. For the designed Genera wheel and the roller conveyor the time requiredby the material to cross the entire belt is calculated accurately. The entire modeling of the project is done with the help of CATIA V5

.In addition to this. The project work has provided us an excellent opportunity andexperience, to use our limited knowledge. We gained a lot of practical knowledge regarding, planning, purchasing, assembling and machining while doing this projectwork. We feel that the project work is good solution to bridge the gates between institutions and industries.

3 Future Scope

□ □ We are glad that we have finished the work with restricted time effectively. "The Geneva Operated Roller Conveyor" is

working with attractive condition. We have done to our capacity and expertise influencing mama to work, let us include

□ □ The proposed idea wills a couple of more lines about our impression venture work. Help underway line where numerous

laborers are utilized for the material taking care of reason it likewise lessen the cost and sifting time prerequisite of more

number of specialist will be totally dispensed with as just two laborers can did the entire activity. The venture objective

initially is to pass on the material taking care of at normal interim of time.

REFERENCES

- [1]. P. Kali Sindhur, "Cutting mechanism by giving feed through Geneva mechanism", International journal of innovation science, Engineering & Technology, vol 2 issue 4, April 2015
- [2]. Han Jiguang Yu Kang, "Analysis & Synthesis of Geneva mechanism with elliptic crank", International journal of hybrid information technology, vol 8 No.8, 2015. Page no: 253 – 260
- [3]. David B. Dooner, "Kinematic geometry of gearing", April 2012.
- [4]. Brown, S.C. Large, "Belt conveyor system"
- [5]. Konakalla Naga Sri Ananth, "Design & Selecting the proper conveyor belt", International journal of advanced engineering technology, E – ISSN 0976-3945.