

ELECTRIC POWER GENERATION USING ROLLER MECHANISM**Kamesh Patil¹, Atharva Pachpute², Gaurav Patil³, Yashwant Salunke⁴, Dr. Vinod Shewale⁵.**¹Student, Mechanical Engineering, MVPS's KBT college of Engineering, Maharashtra, India²Student, Mechanical Engineering, MVPS's KBT college of Engineering, Maharashtra, India³Student, Mechanical Engineering, MVPS's KBT college of Engineering, Maharashtra, India⁴Student, Mechanical Engineering, MVPS's KBT college of Engineering, Maharashtra, India⁵Head of Department, Mechanical Engineering, MVPS's KBT college of Engineering, Maharashtra, India**1. ABSTRACT**

The main objective of this study is to explore the use of gravity roller conveyor. Gravity conveyor provides one of the most versatile & economical means of moving product gravity conveyor can quickly move large quantities of items in virtually any direction with a minimum of effort & expense. The material used for roller and C-channel frame is a mild steel. In this Project we are generating electrical power as non-conventional method by simply passing material on to the specially designed Roller Setup. This method of Electrical power generation needs no input power. This Project is implemented by using simple drive mechanism such as Roller, some interfaced Electrical components and chain drive Mechanism. The basic principle is simple energy conversion form mechanical to electrical energy by using the material weight (potential energy) & motion (kinetic energy).

2. INTRODUCTION

Conveyors are gravity or powered equipment commonly used for moving bulk or unit load continuously or intermittently, unidirectionally from one point to another over fixed path, where the primary function is conveying of the material by the help of movement of some parts/components of the equipment. The equipment as a whole does not move. A roller conveyor supports unit type of load on a series of rollers, mounted on bearings, resting at fixed spacings on two side frames which are fixed to stands or trestles placed on floor at certain intervals. A roller conveyor essentially conveys unit loads with at least one rigid, near flat surface to touch and maintain stable equilibrium on the rollers, like ingots, plates, rolled stock, pipes, logs, boxes, crates, moulding boxes etc. Roller conveyors are classified into two groups according to the principle of conveying action. These are: 1. Unpowered or Idle Roller Conveyor. 2. Powered or Live Roller Conveyor. In an unpowered roller conveyor, the rollers are not driven or powered from an external source. The loads roll over the series of rollers either by manual push or push from an endless moving chain or rope fitted with pusher dogs, rods or clamps. Generally these conveyors operate at horizontal plane, but at times a gentle slope is given to these conveyors to aid motion of the loads. An inclination of 1.5% to 3% ensures that the load will roll by gravity. Such conveyors are termed "gravity roller conveyor". In a powered roller conveyor, all or a selected number of rollers are driven by one or a number of motors depending on the selected drive arrangement. The driven rollers transmit motion to the loads by friction. The powered roller conveyors may be installed at a slightly inclined position, up to 10° up or up to 17° down. The load can be moved in either directions by changing the direction of rotation of the rollers, where these are called reversing conveyors.

3. MODELING AND ANALYSIS

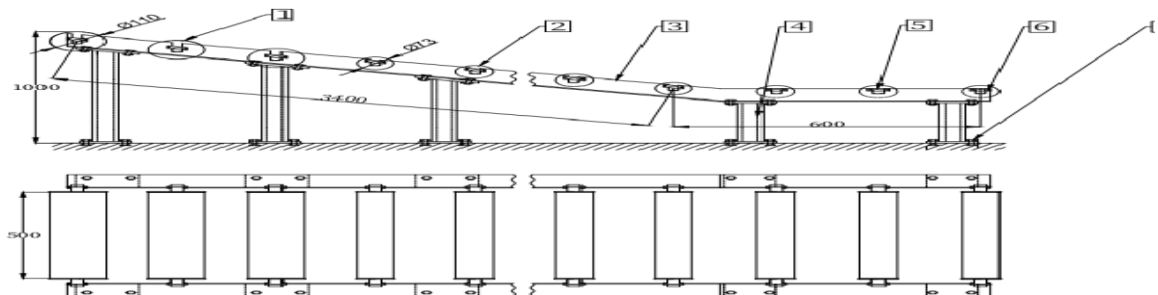


Figure 1: Roller Mechanism Cad Fig.

4. RESULTS AND DISCUSSION

Induced stresses in roller-shaft assembly are as shown below:

From figure it can be seen that 1.03372 MPa is maximum stress induced in the roller due to loads and boundary conditions.

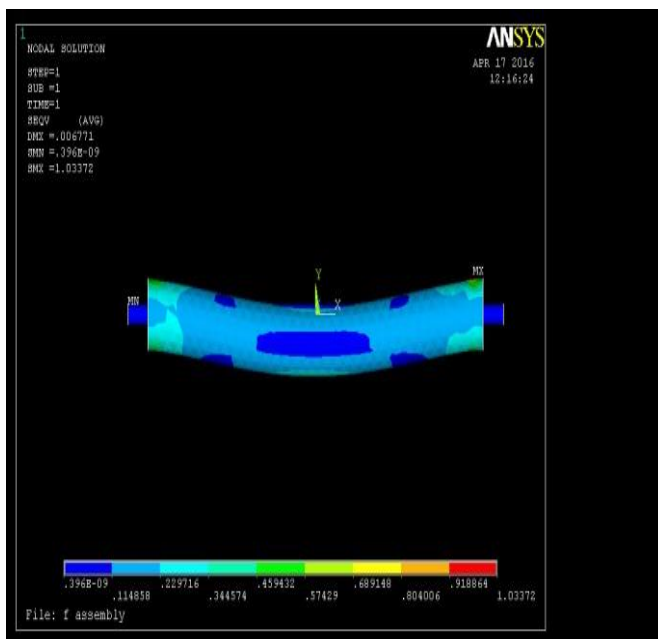


Figure 2: Stress plot

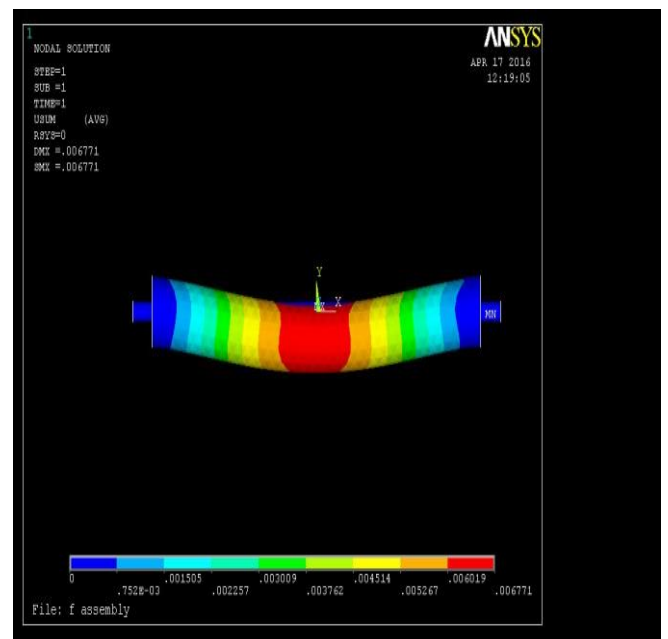


Figure 3: Deflection plot

5. CONCLUSION

No one is happy with current situation of electricity in India We need electricity for every small thing. More suitable and compact mechanisms to enhance efficiency. Although we get less electrical output, this is a simple idea for generating electricity from kinetic energy of the moving material in industry. If this concept is further developed and is produced in high potential, I am confident that enormous amount of power can be developed. These rollers can be designed for heavy material handling, thus increasing input torque and ultimately output of generator by using the multiple transmission system which is more efficient method. An also no any power required to operate to conveyor in industry.

6. ACKNOWLEDGEMENTS

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