



## **ENERGY GENERATING ROLLER CONVEYOR**

**Pardeshi R. H., Ganesh Hon, Zurale Kiran,**

**Rushikesh Jadhav, Dadasaheb Dahe**

*SND College Engineering Yeola India.*

### **ABSTRACT**

Today's world is full of modern technologies and automotive industry is one of the industry that is evolving to modern technology. For this modern fast pace world transportation being the backbone of society, the fact of luxury and comfort has also become of utmost interest for many people. 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). India has huge source of non conventional energy like huge coastal area, hilly areas and bright sunlight uninterrupted. The effective utilization of is useful in the development of nation non conventional energy sources. The utilization of energy is an indication of the growth of a nation. For example, the per capita energy consumption in USA is 9000 KWh (Kilo Watt hour) per year, whereas the consumption in India is 1200 KWh (Kilo Watt hour). One might conclude that to be materially rich and prosperous, a human being needs to consume more and more energy.

### **I 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. The spacing of rollers depend on the size of the unit loads to be carried, such that the load is carried at least by two roll. 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.



## II OBJECTIVE

India has huge source of non conventional energy like huge coastal area, hilly areas and bright sunlight uninterrupted. The effective utilization of is useful in the development of nation non conventional energy sources. One might conclude that to be materially rich and prosperous, a human being needs to consume more and more energy. A recent survey on the energy consumption in India had published a pathetic report that 85,000 villages in India do not still have electricity. Supply of power in most part of the country is poor. Hence more research and development and commercialization of technologies are needed in this field. India, unlike the top developed countries has very poor roads. Talking about a particular road itself includes a number of speed breakers. By just placing a unit like the Power Generation Unit from Speed Breakers, so much of energy can be tapped. This energy can be used for the lights on the either sides of the roads and thus much power that is consumed by these lights can be utilized to send power to these villages.

### Aim and objective of project

- To design and manufacture Energy regenerating roller conveyor System for material handling purposes in food processing industry.
- To generate own power for lighting system.
- To achieve required material transfer rate for smooth operation
- . To bring flexibility in manufacturing process.
- To fix material handling problem in an industry.
- Need in industry to move material from one point to another for food processing.
- To Regenerate Electric Energy.

## III LITERATURE REVIEW

[1] Electric power generation using roller mechanism \_ ( Santosh Sharma & Uday Kumar ) \_\_\_2014 In this project they studied on electric power generation using roller mechanism. By making roller mechanism. If we passed the vehicle from that roller mechanism rollers get rotated and hence electricity get generated.

[2] POWER GENERATION FROM SPEED BREAKERS USING MULTIPLE ROLLER MECHANISM\_ (Ardhendu Chakraborty, K Bharadwaj, Ms. Sandeepa) \_\_\_2010 this project they have studied how to generate energy from speed breakers on road.

[3] In India, the power consumption has spurred so much that under the 12th Plan, the total capacity addition for power generation was 88537 MW, against this, the actual capacity added till December 2014 was 49058. 22 MW. (Commission, 2012) This shows that a need to use other methods for power generation and distribution is required. Use of speed breakers so as to generate electricity is one of the techniques which can help curb the energy crises as well as pollution generated through fossil fuel based energy consumption.

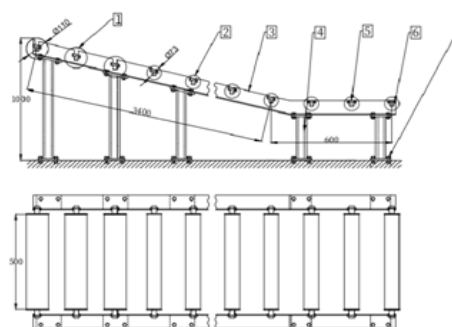
[4] Aniket Mishra (2013) invented a technique to create electricity in rural areas that lack sufficient distribution. A similar approach was started in South Africa as their current electrical crisis in opposition to their heavy demand made them to implement this method to light up small villages of the highway. Techniques that are used both in India and South Africa are Air Piston mechanism, Rack and Pinion mechanism, and Roller mechanism.

[5] Kanak Gogoi (2012) project claims to generate sufficient energy which can be used for sustaining street

lights. However, the only problem with the mechanism is that is workable and efficient for vehicles that are above 1000kgs, this raises the concern for the two wheelers as well. The breakers are large in size which also creates a concern for installment and deep excavation which makes it costly.

### Design Considerations

- The first three rolls will be designed for impact loading. The G will be considered to be 400Kg. The entire weight may impact directly on one of the first 3 rollers. So, for safety point of view, they will be heavy duty rollers (OD 105mm)[1] with axle diameter 30mm.
- Pitch is 200mm. At any time, a minimum of 3 rollers will be in contact with the load.
- For maximum stability, the load was made to sit on the 500x300mm face (length=500mm & breadth=300mm).
- The width of the conveyor should be larger than the width of the load (300mm). A width of 500mm was considered for standardization.
- Jindal Pipes Limited's Seamless and ERW Pipes & Tubes brochure is used for selection of the black pipes.
- Jindal pipes do not manufacture OD 105 mm pipes. The next higher size is 113.1mm. The 113.1 mm should be given a skin-cut to get 110mm as the final OD.
- The rest of the rollers should be medium duty rollers with OD 73 mm[1] with axle diameter 20mm. Jindal pipes produce 75.3mm rough OD pipes. This pipe will be skin-cut to 73mm OD.
- For standardization, all the axles taken should be 30mm. This will constrict the necessity of different bore diameter bearings.
- As the OD of the bearings is less than the ID of the pipes, a bushing will be required to keep the outer race of the bearing in place.
- Machining has to be done along the inner diameter of the pipe in order to push the bearing inside.
- The part of the axle which is between the two bearings on either sided will be given a rough surface finish and can have a diameter of more than 30mm. This will reduce machining costs. The part of the axle in contact with the bearing will be given a good surface finish and will have an exact diameter as the bore of the bearing. There will be an interference fit between the inner race of the bearing and the axle. The part of the axle outside the bearing will have a smaller diameter than 30mm. This will ensure that when the bearing is fitted there is no rubbing between the axle and the bearing





#### IV 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.

#### REFERENCES

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- [10] The ID of the 73mm pipe is taken to be 2.469 inches: <http://www.mcnichols.com/?pageCode=pipedims>