

## DESIGN & MANUFACTURING OF SHUNTING TROLLEY

Mr. Raj Bhalerao<sup>1</sup>, Mr. Abhishek Sagwekar<sup>2</sup>, Mr. Prashant Mohite<sup>3</sup>, Mrs. Arati Davane<sup>4</sup>, Vishal Thopate<sup>5</sup>

<sup>1,2,3,4</sup> BE Student, Dept. of Mechanical Engineering, ACEM, Pune

<sup>5</sup> Assistant Professor Dept. Mechanical Engineering, Alard college of Engineering & Management, Maharashtra, Pune

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### Abstract –

An In a current age of process industry, demand of long-distance conveyor are rapidly increasing. But for maintenance purpose and also for limitation of actual area of installation, customer not able to use the long-distance conveyors our project aim is to design and develop shunting trolley consisting of turning table which joins the two parallel conveyor line. additionally, the various types of material used in manufacturing process and their effect on our project model will be analyzed. We will make the trolley and trains are used to guideway of trolley for movement of trolley we will use the motor and chain to mechanism to provide motion to wheel of trolley and also, we will use the sensors for sensing the nearby object and provide safety and to maintain the orientation of engine we will use the turn table.

**Key Words:** Maintenance purpose, Shunting Trolley, Long-distance conveyors.

### 1. INTRODUCTION

This Trolley is a vehicle that is pulled along tracks on the ground by a moving cable or that hangs from a moving cable. The trolley was invented in 1937 by Oklahoma supermarket owner Sylvan Goldman. Known as the 'shopping cart' in the United States, it evolved from the wire hand-basket, when Goldman noticed that his customers stopped buying as their full baskets became too heavy to carry. As self-service shopping caught on, his trolleys became so popular that he had a seven-year waiting list for delivery by the end of the decade. The word shunting meaning is push or pull (a train or part of a train) from the main line to a siding or from one line of rails to another. Shunting Trolley is Innovative type of transport system Used for various purpose we are used it in assembly line here in this line are enclosed with conveyors and we used this shunting trolley for transport engine from one conveyor to another and making a way in between assembly line for maintenance while production is in stream. For moving trolley, we use trail on which trolley moves and for movement we use motor chain mechanism to provide rotary motion to wheels of trolley to avoid accidents on trails while entering employee inside the line we used here sensors, A sensor is a device that produces an output signal for the purpose of sensing of a physical phenomenon. the sensors are various types but here we will use proximity

sensor which sensed nearby object or human being then these automatically stops the movement, this trolley runs in online production therefor no loss of production while entering into line.

#### 1.1 Problem Statement

Before In every assembly line in industry need to continuously time to time inspection , maintenance every line this two factors are very important ,To have a long distance and continuous assembly line makes the maintenance and product tracking activities difficult if the workplace is small due to whole line is enclosed that why customer unable to go inside the line for inspection , maintenance and for other purpose so customer needed small space to go inside the line for continuously inspection so that they easily do their regular work so for this problem we invented shunting trolley is move on track for movement of shunting trolley we use motor chain mechanism also for safety or to avoid scratch we use turn table and we take wood pallet to make safer mounting of engine this project will run on online due to which reduce loss but if we use manual trolley time for inspection due to it will be moving in online line

#### 1.2 Objective

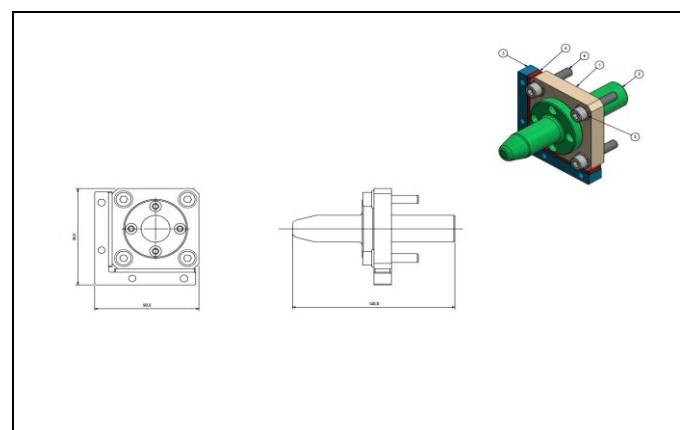
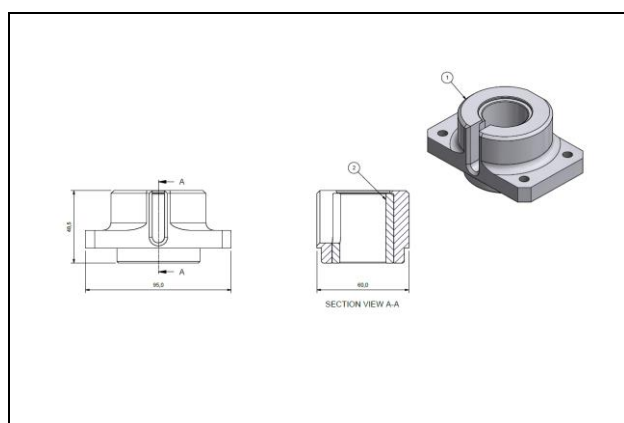
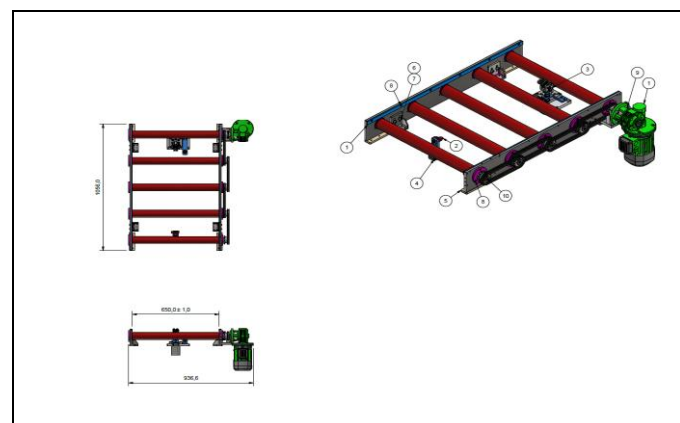
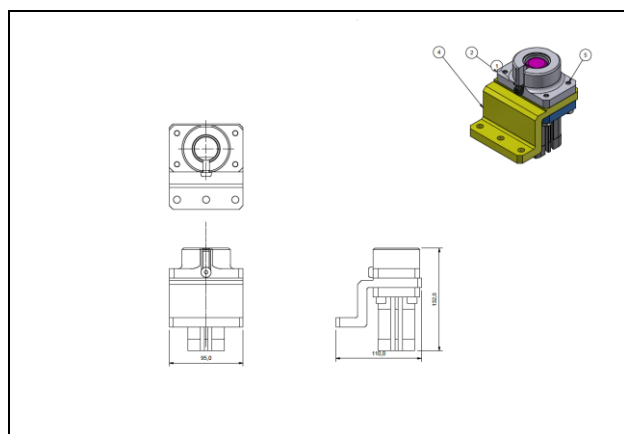
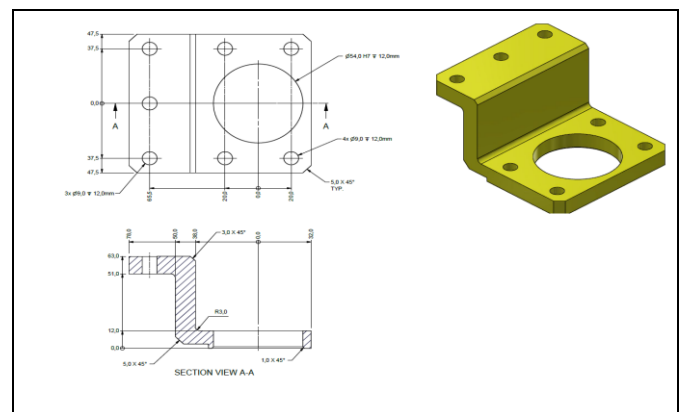
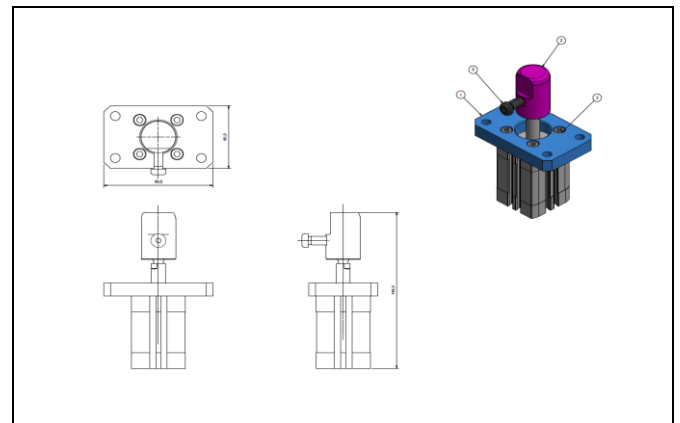
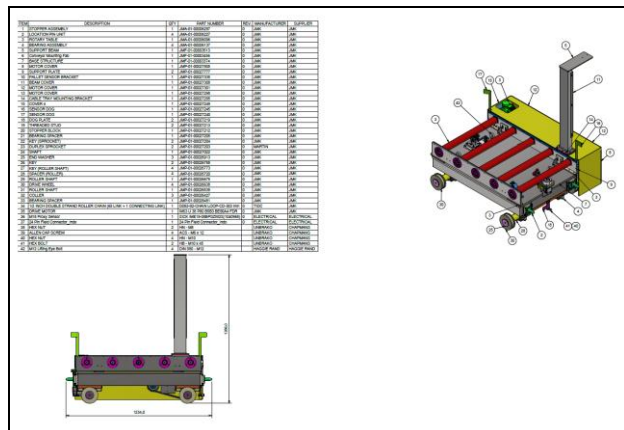
To make space in between two conveyor, reduced loss of production while entering in line no required to stop line due proximity sensor of shunting trolley, to improve quality and maintenance work, use minimum space in line, Access for maintenance team in between the assembly line when is production is on, provide safety to employee while they entering in between line then trolley automatically stop and reduce accidents.

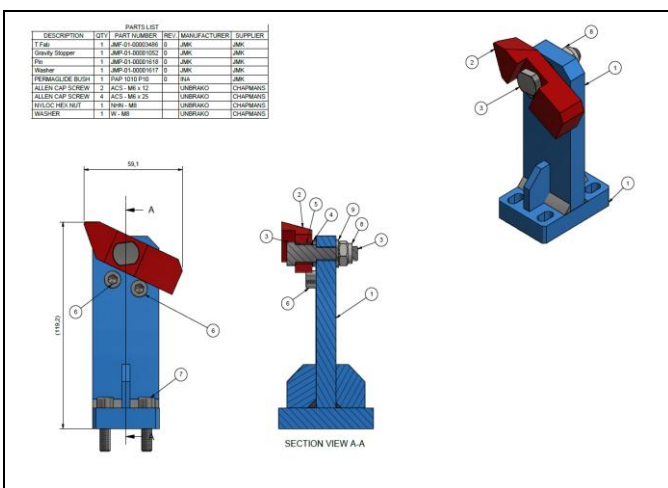
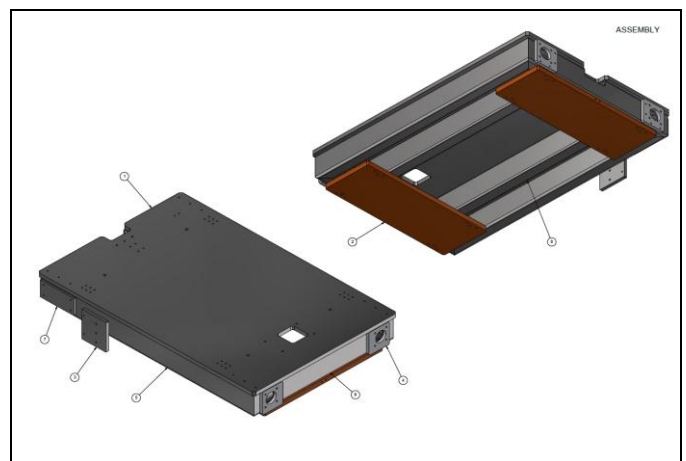
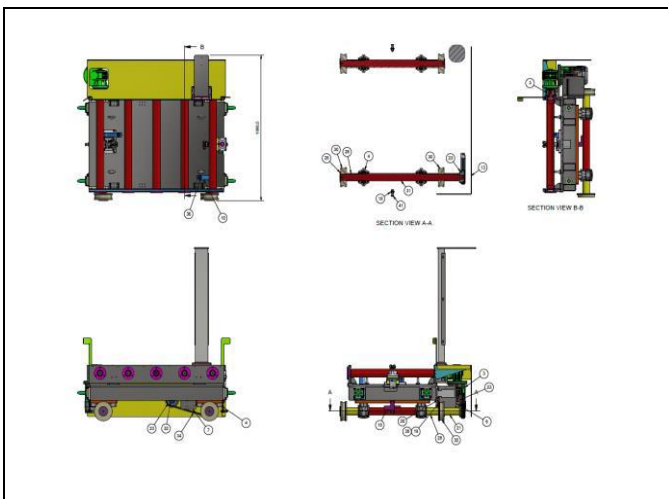
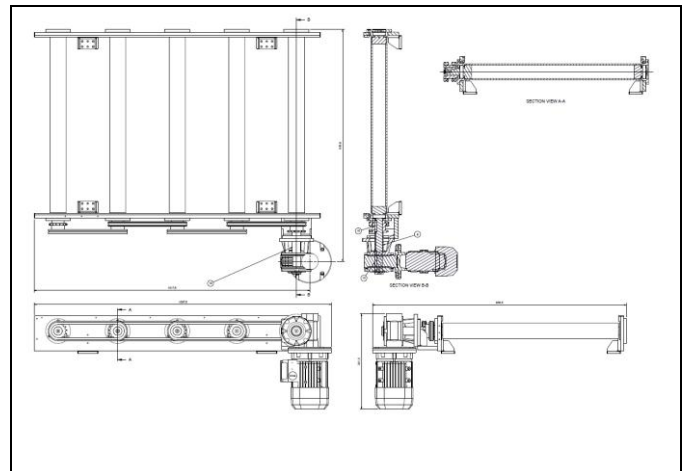
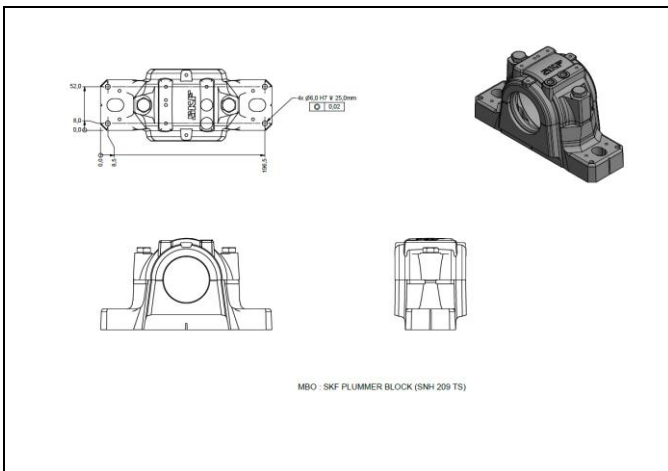
#### 1.3 Scope

The shunting trolley in future we are used in various industries, we can used it in atomization to reduce man work to lift heavy load the trolley lifts weight automatically due to which production is increase we will used it in automatic manufacturing assembly line it creates high impact in terms of quality and quantity of product due to which companies make profits also it is helpful to employees also employee are suffers from dangerous accident while lifting heavy jobs it ensure safety of employees, also we can use this trolley in

shopping malls due to customers are feels ease while doing shopping the reason some person not going to shopping mall due to fear of lifting shopping bags weight so due to shunting trolley use in shopping malls higher impact on society and more and more people happily come to shopping malls and buy more and more products.

### 1.4 Designs





## 2. Literature Review

Literature review is an assignment of previous task done by some authors, scientists, engineers and collection of information and/or data from research paper published in journal to progress our task. It is a way through which we can find out new ideas, concepts, techniques, policies, etc. There are lots of literatures published before on same task. Only four papers are takes into consideration and our practices from which idea of seminar is taken into mind.

### 2.1 Pratik Gulaxéal (January 2013)

CAE Computer-aided engineering (CAE) is the use of computer software to simulate performance in order to improve product designs techniques can be Use to increase the performance of gearbox and thereby increase the efficiency of material handling trolley of cupola furnace. Also, to ensure simulation and experimental results, a prototype model was tested with the help of FEM software. This paper reviews the modeling and computer simulation as a tool for aiding gearbox used by various researchers earlier. The results of computer simulations and results obtained by actual experimentation were compared to get detailed idea about the parameters which can affect the increase in speed

drastically. The factors were divided into four groups: design factors, production technology factors, operational factors and change of condition factors. Keyword: Gearbox, CAD, CAE, FEM, Cupola.

## 2.2 Daniel J. Fonseca, GopalUppal, Timothy J. Greene (2003)

Conveyor equipment selection is a complex, and sometimes, tedious task since there are literally hundreds of equipment types and manufacturers to choose from. The expert system approach to conveyor selection provides advantages of unbiased decision making, greater availability, faster response, and reduced cost as compared to human experts. This paper discusses the development of a prototype expert system for industrial conveyor selection. The system, which was developed on Level V Object, provides the user with a list of conveyor solutions for their material handling needs along with a list of suppliers for the suggested conveyor devices. Conveyor types are selected on the basis of a suitability score, which is a measure of the fulfillment of the material handling requirements by the characteristics of the conveyor. The computation of the score is performed through the Weighted Evaluation Method, and the Expected Value Criterion for decision making under risk. The prototype system was successfully validated through two industrial case studies

## 2.3 Vidyasagar R. Bajaj, B.R. Borkar (12 December 2014)

In this review paper an integral shaft bearing is popular for higher specific load carrying capacity, preventing misalignment defects and eliminating the risk of undesirable distortion of the bearings, rather than Conventional one. Integral Shaft Bearing is used to reduce rotational friction and support radial and axial loads Friction in bearings which cause an increase of the temperature and Stresses inside the bearing. If the heat produced cannot be adequately removed from the bearing, the temperature might exceed a certain limit, and as a result the bearing would fail. To analyze the heat flow, temperature distribution and stresses in a bearing system in this study we investigate structural and thermal characteristics performance of Integral Shaft Bearing to Analyze temperature distribution and thermal elongation due to friction also its effect on bearing clearances. Reduce frictional losses due to effect of temperature reduction for the heating parameters.

## 2.4 Ambepasad S. Kushwaha (30 March 2012)

A ball bearing is a type of rolling-element bearing that uses balls to maintain the separation between the bearing races. The purpose of a ball bearing is to reduce rotational friction and support radial and axial loads Friction in bearings causes an increase of the temperature inside the bearing. If the heat produced cannot be adequately removed from the bearing, the temperature might exceed a certain limit, and as

a result the bearing would fail. To analyze the heat flow in a bearing system, a typical ball bearing and its environment has been modeled and analyzed using the finite element method. The maximum temperature in the bearing has been calculated as a function of time with the rotational speed as a parameter. The goal of this analysis was to see how fast the temperature changes in the bearing system and if a given maximum temperature (e.g., maximum temperature of the lubricant or bearing metal) is reached. The simulation showed that the higher the rotational speed is, the faster the system reaches a steady state. The bearing did not reach a critical temperature in any of the examined rotational speeds. Scuffing a failure phenomenon i.e., is observed as a result of thermal phenomenon.

## 3. Advantages & Applications

### 3.1 Advantages

1. Provide space in assembly line for inspection and maintenance purpose.
2. It Increase the production because it is run in online process.
3. Provide the safety to employee while crossing the trail of trolley. Manufacturing Is easy.
4. Reduce the man work.
5. Skilled Labor not required.

6. Increase the speed of manufacturing lines due to its automation.
7. Cost is less.

### 3.2 Applications

1. Used in assembly lines to provide space in assembly line.
- 2.. Use to transport heavy parts easily.
3. Used in automatic manufacturing lines.
4. In shopping malls, other industries etc.

## CONCLUSION

The customer Need some space in between assembly line that's why to make small space in between two conveyor we make shunting trolley is working successfully is taken automatically engine from one conveyor and supplied it to another conveyor also it ensures the safety of employee while crossing the trail of trolley due to the sensors of trolley. as we designed trolley it successfully fulfills the problem of customer practically so we can use this trolley in future for various assembly to provide space or to transport the heavy jobs in lines automatically which improves line

works and due to which increases the line production because in manual transportation of heavy parts lots of man power required for these not any safety factor in manual transportation so it should be used in various manufacturing lines.

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