

DESIGN AND ANALYSIS OF BELT CONVEYOR SYSTEM

Aniket Wangal¹, Dr. A K Mahalle²

Abstract: In the following paper we will discuss the design and design calculations of belt conveyor system for valve body, we will also discuss its dimensions, its loading capacity and its velocity, diameter of roller, power and tension, spacing between its idlers, pulley location and its arrangement, control mode. So in this way we will design the belt conveyor according to above design considerations and will do the analysis of belt conveyor system.

Keyword: Belt Conveyor system, Idler spacing, Loading capacity, handling equipment.

I. INTRODUCTION

The main goal of my paper will be to provide efficient and affordable flat belt conveyor system so as to reduce the cost of labour and it will also increase the productivity. Conveyor system is a moving device which transfers materials from one place to another. Conveyor systems are more preferable in materials transportation than conveying the materials by hand held and by lift system. So I have to choose such a conveyor so that it can satisfy the needs of the company from this different conveyor systems like gravity, belt, screw, vibrating, chain, spiral, etc. So I am going with flat belt conveyor systems so as to get the smooth conveying process.

II. LITERATURE REVIEW

[1] Alspaugh M. A. shows that recent development in belt conveyor technology & the example of traditional components in unconventional examples including curves in horizontal direction.

[2] I. A. Daniyan states the calculations regarding design for belt conveyor system of limestone which is done by using three rollers. He also discussed its dimensions and speed, its motor power and belt tension, spacing between supporting rollers, pulley location and its arrangement, its rotating angle and rotation co-ordinates, mode of control, its maximum capability of loading in order to confirm quick, constant and structured movement of crushed limestone while keeping away any damages during loading as well as unloading.

[3] Devendra Kumar, R.K. Mandlo discusses the modifications in belt conveyor technology. The literature survey of belt conveyor and its design modification and recent technologies. The focus is on scheme as Design modification, Failure of pulley and its drum, Design of belt and its failures, energy & productivity, friction, quality, process & preservation and fire & well-being.

[4] Vinod M. Bansode said that paper on the Fatigue Life Prediction of a Butt Weld Joint in a Drum Pulley Assembly by utilizing Non-Linear Static Structural kind of Analysis. A disappointment examination dependent on stress life approach might be helpful for imagining the existence cycle of weld in the structure.

III. PROPOSED DESIGN

After studying four different papers on different aspects regarding the belt conveyor I came to know that belt conveyor has to be designed by considering proper design parameters and then I have to go with the design procedure so as to achieve desirable results in analysis and to get the results to some accuracy. So the design procedure will go from the conveyor belt dimensions like its length, breadth and width, so after deciding above basic dimensions I will go to roller and pulley diameter then will directly jump to power and tension calculations. Then by assuming some data like velocity of the belt conveyor based on idle and machining time of the valve body machining operations to give design calculations to the organization for developing a belt conveyor system out of it for the valve body.

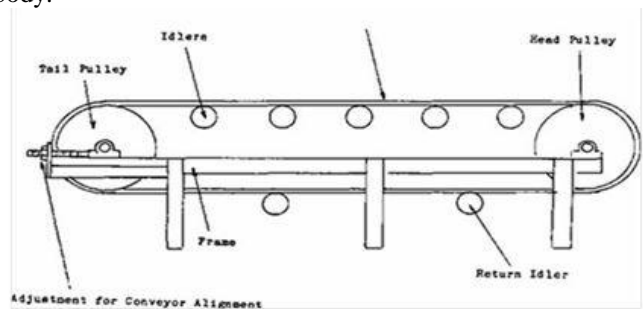


Fig.1 Schematic Diagram of Belt Conveyor System

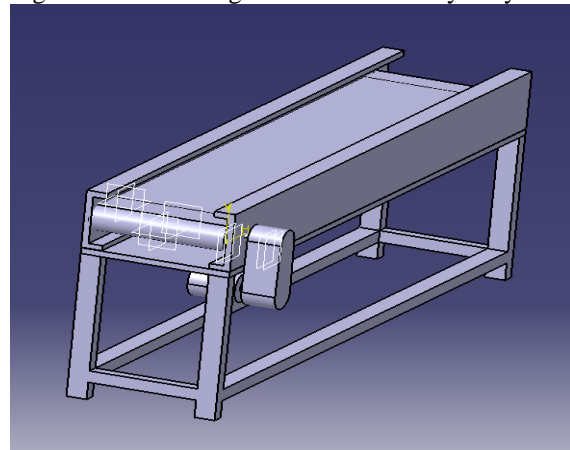


Fig.2 Isometric view of Belt Conveyor System

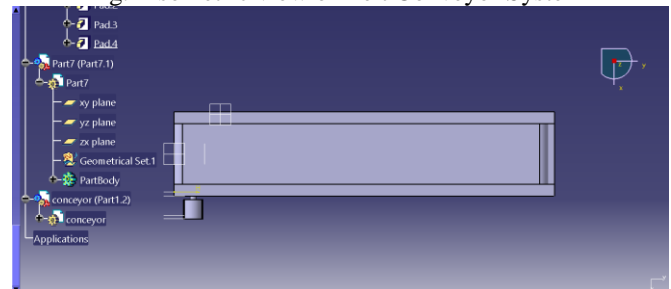


Fig.3 Top view of Belt Conveyor System

IV. CONCLUSION

Belt conveyor system is designed by assuming certain design considerations according to the requirement of the industry to convey the valve body upto 12 m in length and accordingly the analysis is done.