

DESIGNING CHAIN CONVEYOR FOR SPRING PAINTING

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ABSTRACT

Roller chain is to deal with different chemicals and environment conditions, causes wear and tear of components of chains and hence unexpected failure and costly production. conveyor consist of two or more endless strands of chain with attached non interlocking slats to carry the material. Some other examples are conveying pallets and tree stumps. Wheeled cars is example, is carried by the chain but can also be pulled by the chain. Recent work I have studied different failures of roller conveyor chain links under different loading condition using mild steel. Chain conveyor system motor capacity of conveyor depends on weight of chain. This was determined that maximum amount of weight of chain

conveyor is covered by outer link and inner link. we are concentrated on both link and weight reduction of link by using composite material to reduce the power requirement of conveyor.

INTRODUCTION

Our conveyor chains, sprockets and other products are widely used in mainstream conveyor systems, to meet customer requests. Their specifications, Applications and environments are very diverse. Nevertheless, errors or shortcomings in selection, handling and maintenance can not only impede the flow of material on the conveyor but can cause major accidents, including chain breakage and conveyor damage. This catalog includes information to assist in the correct selection,

handling and maintenance of chains and sprockets, so please read it with care before using our products. Roller conveyor chains are generally used in production or assembly lines where individual large objects need to be conveyed. Roller conveyor chains differ from transmission roller chains such as a bicycle chain, which is used to transfer torque instead of conveying goods. Conveyor chains have a large pitch which is efficient in bridging large distances with fewer shackles; they generally have thicker side plates and rollers with large diameter. Therefore they can withstand higher tensile and shock loads than transmission chains. Furthermore they can bear large amounts of wear before breakage occurs. On the other hand, roller conveyor chains have a necessary clearance that easily becomes contaminated with particles from the conveyed material. A typical conveyor chain is constructed with two different types of shackles, the roller link (or inner link) and the pin link (or outer link), see Figure 1. The roller link consists of two steel bushings that are press-fitted inside the roller link plates, while the pin link consists out of two steel pins press-fitted inside the pin * The speed

to controlled or vary during operation oriental motor offers to use speed control motor that offer a wide speed control range torque regardless of load * Take chain pitch and multiply Two * Multiply above number by of teeth on sprocket of saw * A gear system consists of a chain and sprocket along with a sprocket wheel that has either teeth or cogs 3 * This includes a perforated chain that can be tracked or consists of indented materials * They are commonly referred to as a coli spring or a helical spring .they are used to store energy and subsequently release it to absord shock or to maintain a force between contact surfaces *Impeller is a rotating component of a centrifugal pump which transfers energy from the motor that drives the pump to from the motor that drives the pump to the fluid being the center of rotation The chain conveyer installations have been used for moving a wide variety of goods and materials for many decades. They continue to provide the fastest, safest, most effective and economical method of transportation over relative long distance often in areas where space is limited an operating under some of the most adverse conditions

imaginable. The conveyer belt plays an integral role in the efficient operation of every conveyer system and has to be able to cope with an enormous variety of stresses and demands. Conveyor chains can be loaded in two ways which is the force can be applied on the side plates by use of attachments which are connected to the side plates, see Figure 1. Alternately the force can be applied on the pins. Therefore hollow pins and axles instead of solid pins (as shown) are used. The rollers transfer the normal force, due to the weight of the conveyed objects, to the track. The driving sprocket exerts a force on the chain to pull the load, this results in a tensile force inside the chain which must be large enough to overcome the sliding friction between roller/bushing and the rolling friction between roller/track. Additionally the chain is restressed by the sprocket this will result in a raise of tensile force. To transfer this tensile force from one shackle to another, bushing and pin will act together as a bearing. A chain is a machine component that comes with a series of a connected links. It can be used to transmit power or conveyance systems. Usually, there are

five types of chains that are cast iron chain, cast steel chain, forged chain, steel chain and plastic chain. The advantages, conveyor chain had been applied widely in coal mining, food processing, sewage treatment, timber harvesting, agricultural, bakery, harvesting, and textile machines, car, cement, and chemical plant, and sorting, handling, and material conveyors. Sometimes failure of the conveyers also could happen. Failure mean is not meeting a desirable or intended objective. There are five general failure categories that are fracture (full section), cracking (partial section), distortion (bending, elongation, and plastic collapse), corrosion (pitting, through wall perforation) and wear (material wastage). All the failure caused by defect in designing, manufacturing, operating and environment. There are two types of defects that are generally observed in material. The first one is inherited defects where the origin is in the ingot and the other one is generated defects that are introduced in the material during various metal working operations and thermal treatments.

LITERATURE OF REVIEW

The work has been done to increase breaking strength of chain link, two options are applied, resolved and validated and best suited option is selected for implementation. Objective to increase the chain link breaking strength from 40T to 70T without changing the pitch, 216 mm has been achieved by following two options Based on above discussion, it can be resolved that with increase in fork diameter and thickness of chain link, strength requirements have been met Topics dealt with in the survey include experimental detection of wheel/rail impact loads, mathematical models to predict the development and consequences of out-of-round wheels, criteria for removal of out-of-round wheels and suggestions on how to reduce the development of out-of-round chains. The Literature survey discusses the state-of-the-art in research on why out-of-round railway wheels are developed and on the damage they cause to track and vehicle components. Although the term out-of-round wheels can be attributed to a large spectrum of different wheel defects, the focus here is on out-of-round wheels with

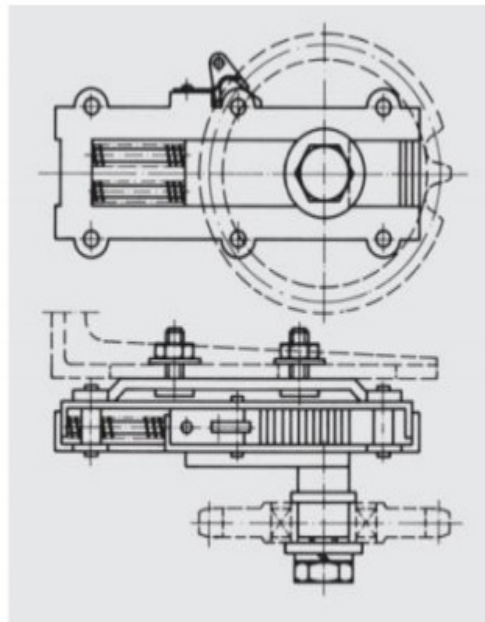
long wavelengths, such as the so-called polygonalization with 1-5 harmonics (wavelengths) around the wheel circumference. Topics dealt with in the survey include experimental detection of wheel/rail impact loads, mathematical models to predict the development and consequences of out-of-round wheels, criteria for removal of out-of-round wheels and suggestions on how to reduce the development of out-of-round wheels.

METHODOLOGY

The basic aim of this paper has been conducted on the most of the time conveyor chain is under tension which causes failure of chain assembly which is the major problem for industrial sector. All these parameters can be considered simultaneously and chain link design optimally. Optimization is the process of obtaining the best result under given circumstances in design of system. In optimization process we can find the conditions that give the maximum and minimum value of function. So it is necessary to decide new material and design the new chain with suitable design process.

The rail vehicle has two types of suspension spring viz. primary and secondary suspension spring. The two sets of primary suspension springs are mounted near each wheel. The vehicle having total six axles which divided in two frames . three axles on frontal side and three axles on rear side. Among three suspension spring middle axle has composite set of assembly of inner and outer spring and linkage to move laterally at horizontal curves . The remaining two axles end axles only has two sets of primary spring whose free height is less than middle axle spring and having damper provided between axle and frame to restrict lateral deflection. This case study reveals the high stresses and deflection occurs on springs in lateral and longitudinal direction responsible for the failure due to shear stress concentration. The analysis has been carried out for various horizontal and vertical curved radiuses of the Indian tracks. The observation finds the exact stress concentration over spring at the 2nd to 3rd coil from the top end. The lateral and longitudinal seam of load causes the extra deflection and affects spring causes maximum shear stress in inside diameter

CHAIN DESIGN



IMPELLER ASSEMBLY

- Ensure fits and limits on bearing.
- Measure bearing clearances of free bearing.
- Fit the outer race bearing in bearing housing.
- Adjust the rotor into the stator.
- Fit inside grease cups of both side to the rotor shaft.

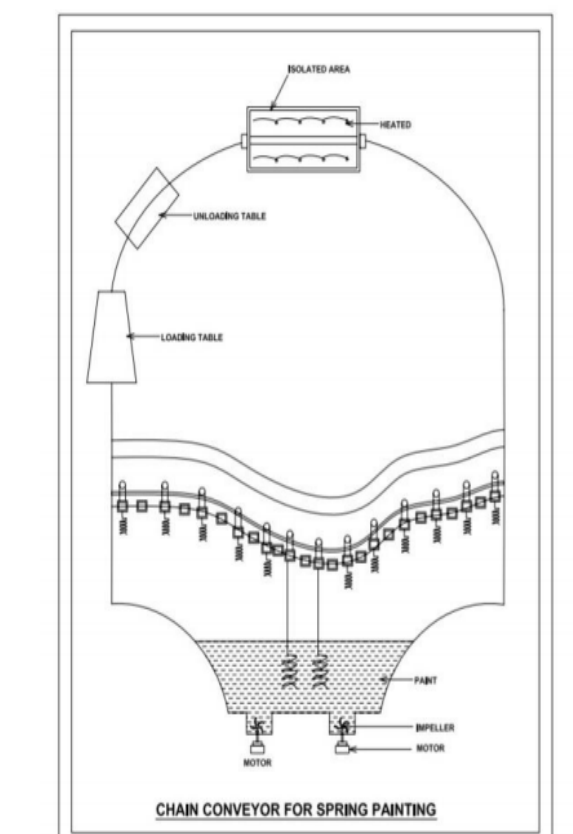
- Fit the bearings to the rotor shaft by induction heating.
- Fill the grease into the both bearings.
- Fit cir clip to rotor shaft at non – driving end side.
- Fit both side end covers.
- Fit steel ring.
- Fit outside grease cups.
- Fit terminal box.
- Put the sleeve to the terminal leads

CHAIN CONVEYOR

A conveyor chain is chain that has been designed specifically for chain conveyor systems. It consists of a series of journal bearings that are held together by constraining link plates. Each bearing consists of a pin and a bush on which the chain roller revolves. Hollow bearing pin chain Hollow bearing pin chain allows attachments to be bolted through the hollow bearing pins. Attachments may be tightly fixed or held in a 'free' manner. • Solid bearing pin chain Solid bearing pin chain

has the same dimensions as hollow bearing pin chain but is more robust and thus suitable for more arduous conveyor applications. • Deep link chain Deep link chain has deeper side plates than the normal chain plates and so provides a continuous carrying edge above the roller periphery. Deep link chain comes in solid and hollow bearing pin varieties. • Drop forged chain Drop forged chain (also known as en-masse conveyor chain or scraper chain) is already fitted with attachments that have been welded directly onto the chain links. . [3] proposed a system, this fully automatic vehicle is equipped by micro controller, motor driving mechanism and battery. The power stored in the battery is used to drive the DC motor that causes the movement to AGV. The speed of rotation of DC motor i.e., velocity of AGV is controlled by the microprocessor controller. This is an era of automation where it is broadly defined as replacement of manual effort by mechanical power in all degrees of automation. The operation remains an essential part of the system although with changing demands on physical input as the degree of mechanization is increased.

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CONCLUSION

In this topic we are going to see the weight of the glass fiber is very low compare to mild steel. The glass fiber is non corrosive. Self lubricant and mechanical property is also good as compare to mild steel. The conveyor system is successfully improvised using drive chain. The conveyor move without causing any slippage although

the conveyor need a regular maintenance to avoid any casualties in the future. the research contract and represents an important stage which will lead to an increased number of orders received by the beneficiary partner, but also as a working model for other users with manufacturing activities in the field. This project also helps student to utilize their engineering information and improve the skill of student in solving the mechanical problems.

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