Study of Material Handling Through Power and Free Conveyor System

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Abstract:- **An inverted and over head power free conveyor utilizes a single enclosed track combining the power chain and the free trolleys. The power and free system uses fixed chain dogs that engage the pivoted free trolleys to move them through the system. Disengaging the free trolley from the chain dog allows for free trolley accumulation.**
Area of use include production areas or delivery systems that require accumulation such as general assembly, body shop, painting and oven drying.

INTRODUCTION

Power and Free Conveyors

Power-And-Free Conveyors are variation of Overhead Conveyors .In a conventional overhead conveyor the carrier is permanently fastened to the drive chain. In the power and free case, the carrier can mechanically disengage from the drive chain and essentially idle while the chain continues to move. Power and free conveyors can also be inverted so that they can be mounted to the floor, in which case the carrier or tray rides on top of the guiding rail as opposed to being suspended beneath it. Power and free conveyors are ideally suited to demanding industrial environments that require a high degree of versatility. These systems provide the unique ability to stop individual loads without stopping the entire production line. It has played an important role in the improvement of productivity and quality in a wide variety of manufacturing environments.Power-and-free conveyor is a conveyor that has inherent in its design. That is flexible routing, variable speeds, the ability to accumulate or stop carrier, sort product, and move through processes, overhead space utilization, precision to work with automation, and easily expandable and adaptable to product change.

A power and free conveyor wherein each load carrier comprises a plurality of trolleys, the foremost of which has dogs for engaging with driving dogs on the powered conveyor element. The rearmost trolley of each load carrier has control means operative when a following carrier comes into proximity with the rearmost trolley to disengage a driving dog of the following carrier from a driving dog of the powered conveyor element. The rearmost and next adjacent trolleys of each load carrier are connected with one another by a telescopic draft member which can pivot laterally relative to each trolley. The draft member contains a compression spring which absorbs a substantial part of the momentum of the following load carrier when the carriers come into proximity.

TYPES OF CONVEYOR SYSTEMS

STANDARD (MONORAIL) SYSTEMS

Monorail conveyor systems are simple and efficient, working well for those searching for low initial setup costs. These systems can be manual push or powered using a continuous chain, powering the chain as it leaves the drive unit and suspending parts by a variety of pendant options. Monorail systems follow one path and greatly benefit straightforward processes.

RW Conveyors builds several different kinds of monorail conveyor systems:

- Safe-Rail Monorail Enclosed Track Conveyors
- Zig-Zag Monorail Enclosed Track Conveyors
- PaintLine Inverted Monorail Conveyors

POWER AND FREE SYSTEMS

Overhead power and free conveyors offer operators unparalleled flexibility for a variety of parts and processes. They can stop and start parts easily, perform at multiple speeds, divert to multiple locations, and provide part-tracking options as needed. These systems use pusher dogs to engage and disengage connections between chains and trolleys.

RW Conveyors offers several high-end power and free conveyor systems:

- Twin-Trak Side-by-Side Conveyors
- OveR-Way Heavy Duty Over and Under Conveyors
- OveR-Way Inverted Floor Mounted Conveyors

CONVEYORS FOR YOUR FINISHING PROJECTS

While smaller operations may see great success with monorail systems, companies that require flexibility or fill

high-volume orders may make the jump into power and free systems.

No matter your project's requirements, our experienced consultants will work with you to develop optimized belt and finishing solutions. Contact us to request a quote today or find out which applications and systems are right for your organization.
For asynchronous conveying, enclosed track Power and Free conveyors are some of the most versatile power and free conveyors in the industry due to compact design and ability to carry loads in "slot down" or "slot up" (inverted Power and Free) orientations. Important features include:
24″ radius vertical curves, smallest in the industry
Low profile track sections, only 5.4″ high
24″ radius horizontal curves
Combination free trolleys that allow as little as 7″ c-c accumulation
Smallest switches in the industry; a single merge/diverge combination switch is only 30″ long
Two trolley/load bar arrangement and four trolley/load bar arrangements available for heavy loads.
Other features of Power and Free conveyor:
Bolted track design for easy assembly without welding.

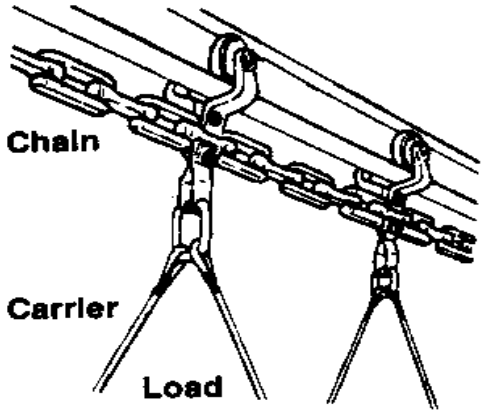

Fig.1

Modular track components ensure quick onsite installations and modifications with reduced installation labor costs and minimal downtime.
Free trolleys have "flippers" that allow the conveyor to be inverted for sanitary applications or clean paint lines.

Fig.2

A simple drive dog design utilizing an inexpensive cast piece can be inserted into the chain on as little as 8″ c-c. More dogs on closer centers results in quicker release and shorter cycle times.
Trolleys in accumulation are in minimal contact with drive dogs resulting in quieter operation.
Combination "wheelturn/ takeup drive" saves time and money.
The Unibilt Uni/Uni has the maximum capacity of 250 lbs. per trolley, 500 lbs. per two trolley/load bar arrangement) and the Unbilit Uni/3" has the maximum capacity of 750 lbs. per trolley, 1500 lbs per two trolley/load bar arrangement).
The S-310 Power and Free Conveyor has a 200 lb. load capacity per trolley, 400 lbs. can be supported from a two trolley/load bar arrangement, and a load of 800 lb. can be supported from a four trolley/load bar arrangement. The S-320 Power and Free Conveyor is very similar to the S-310, utilizing the same powered chain but with twice the free trolley capacity (400 lbs. per trolley, 800 lb. per two trolley/ load bar arrangement).

Fig.3

POWER AND FREE CONVEYORS ARE WELL SUITED FOR APPLICATIONS SUCH AS:

Paint lines where products need to be routed to multiple spray booths or where accumulation in an oven or elsewhere is advantageous
"Live" overhead storage of products, where high density is key
Work in progress
Assembly lines where non-synchronous movement is required.

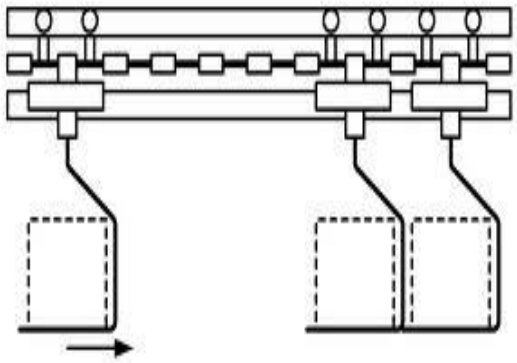

Fig.4

FINISHING APPLICATIONS

Powder coating can be thought of as paint minus a solvent component. It's applied electro statically while completely dry as free-flowing powder. We then cure this coating using heat to finish off the process. Powder coating offers excellent durability: when cured, it's actually harder than conventional paint. The procedure generates a minimal amount of waste, benefiting the environment along with your bottom line.

Wet paint finishing tends to be the finish of choice for applications too heat-sensitive for powder coating. This traditional finishing method has become more advanced over the years, but the basics remain unchanged: workers apply liquid paint to a metal product using a spray, pump, or pressurize vessel and allow it to dry into a durable, aesthetically pleasing finish. Dip line finishing systems hang parts and then immerse them in dip tanks before pulling them back out. These tanks can hold a variety of different chemicals for different purposes. Parts can generally expect to go through some combination of a prewash, a chemical pretreatment, and a cleaning process for preparation purposes. We then dip parts in electro phoretic coatings and wet paint for final paint finishing.

Electro phoretic painting process (E-coating) uses electrical currents to attract paint to a metal surface through an immersion system. Parts are charged opposite of the paint particles suspended in a fluid bath before being dipped into the liquid. The paint particles then build up over the part's surface to form an even and low-profile film.

CONCLUSION

Power and free conveyor systems are built on a two-track system and can help optimize and improve your available space through automation and expert systems, Power and free conveyors are called "power and free" because one track is operated by a powered.