Candy Worx Belt Coater Automated Belt Cleaner

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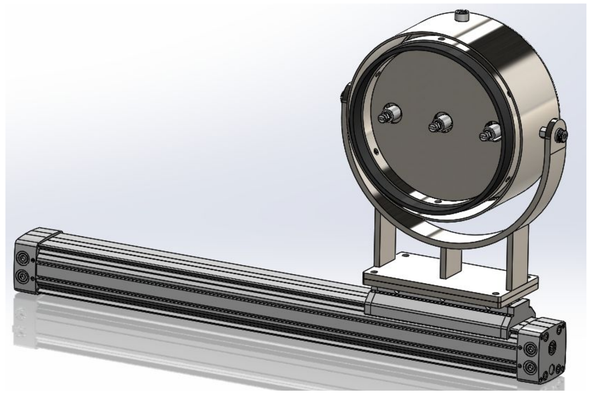
Abstract

For this project, the group assigned was partnered with CandyWorx to find a solution for the accumulation of product buildup on the Belt of the CandyWorx Revolve Belt Coater. This project is to display the mechanical knowledge of the team through various forms of problem solving. The team used CAD, mechanical calculations, finite element analysis, and assembly to test the skills provided through Northern Illinois University. Through this project the team used various methods and calculations to produce a one-of-a-kind prototype for CandyWorx to improve upon and incorporate into their line of products. The team was tasked with developing a product that could be self-contained within the Revolv Belt Coater, that in eventuality would use steam as the main vessel of sanitation, along with a form of mechanical agitation to remove any larger accumulations of product layered on the surface of the belt.

Introduction

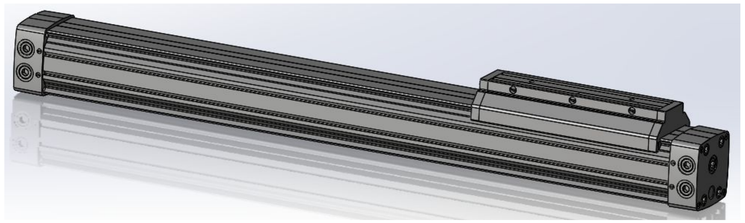
Objectives:

1. Use Low Pressure Steam & Sanitizing Solution to clean belt and hard to reach areas
2. Reduce Fugitive Steam
3. Be adaptable to different size belt coaters
4. Fit within the existing enclosure of the Revolv belt cleaner.

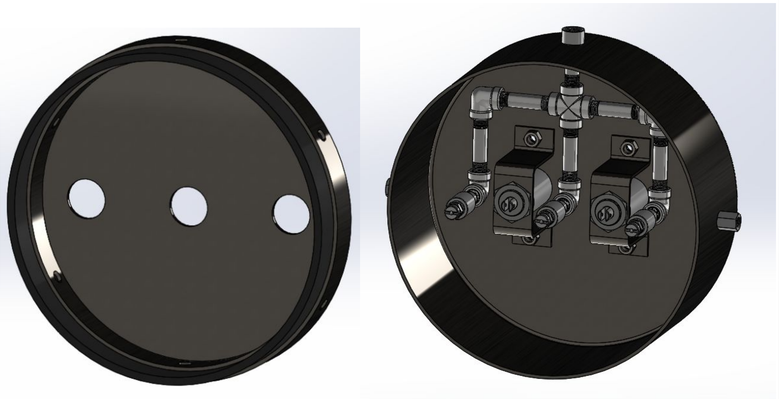


Methods and Materials

Method of Travel: A rodless air slide was to traverse the belt cleaner prototype across the entirety of the span of the Revolv Belt Coater Belt. Due to its compact nature and simplicity, it can be directly incorporated into the Revolv Belt Coater system.



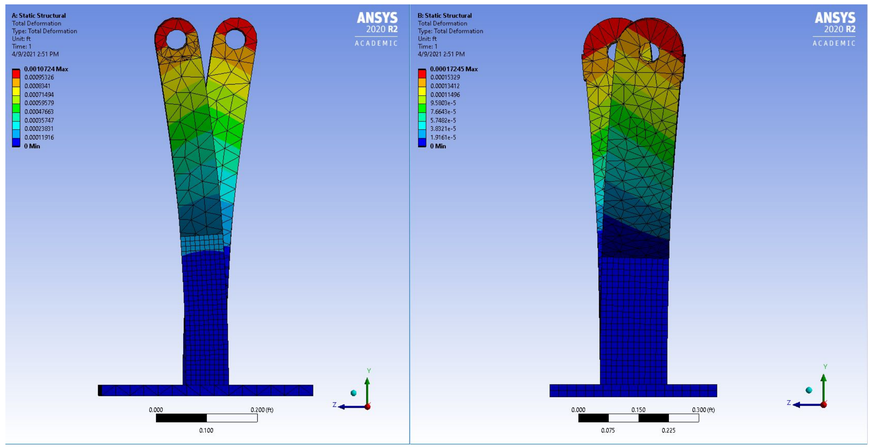
Steam delivery: Steam is supplied to the surface of the belt, through a three nozzle delivery system routed through the body of the belt cleaner. The scraper assembly then encloses the steam as it is being produced to mitigate fugitive steam.



Mechanical agitation: A scraper assembly is attached to linear actuators to extrude the scraper during the cleaning operation and retract during production. Due to the food safe nature of Viton and Stainless steel the scraper meets FDA requirements as it comes into contact with the belt covered in product.

Results

Through Ansys analysis, a justification was made to upscale the mounting bracket from a ¼ in. x 1 in. mounting bracket to a ⅜ in. x 2 in. mounting bracket to reduce stress and deformation placed upon the bracket and overall increase longevity.



Conclusions

The design and fabrication of the R&D prototype conveyor belt system was a success and is ready for use of further testing and presentation.

Acknowledgements

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