Ball Scoop

Make It Real CAD Engineering Challenge

751C | Change Up 2020-2021

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BVH Baron Bots

Introduction

The Ball Scoop was designed with the purpose of picking up a ball effectively and efficiently. This part is important in the process of holding a ball with the least amount of hardware needed and the best weight efficiency, a lightweight and sturdy piece to ensure that picking up balls can be done consistently. Having this as our means of collection could prove to be very beneficial to the bot. Alternatives in VEX are not round and suited to competitions or challenges involving round objects, for example, this year’s ball scoring mechanism. A ball scoop allows for more depth in design because robots, including ours, would be able to specifically address round objects. This would be used in our robot to not only score the points in the hoop but will open up other vital options such as pushing the opponents' teams balls during this year’s competition. This would double our efficiency in resources used and points gained in the competition.

Design

We began brainstorming the needs of our bot. We wanted a mechanism that could transport and hold balls in this year's VEX robotics competition. As our team continues to pitch ideas, we thought of a concept we've seen in the movie *The Sandlot,* a scoop arm that could hold a baseball. Our design process began with some basic sketches, it took some different ideas and changes until we had our final design. Using Fusion 360 {V.2.0.9439}, we were able to visualize and foresee problems that could arise in the future, hence we were able to make changes as we went. Fusion 360 enhanced our collaboration, engineers were able to see the piece changes and adjust it if a flaw was found. Fusion 360 also helped us organize our thinking into a clearer picture to end up with a great final piece. Our engineers, who worked together to constantly advance our design, were able to be as effective, and fast as possible with the design. Our final design achieved our goals, we had developed a sturdy and efficient piece that was able to hold a ball.

Conclusion

The Make-It-Real project was important since it allowed us to innovate and develop creative solutions to our VEX robotics needs. Brainstorming and developing a ball scoop has given our team an opportunity to expand our knowledge and push our problem-solving skills past our comfort zones. This development of creative solutions also helped us find the strong points of our team and the ways we can improve. Fusion 360 also introduced us to the world of CAD. As beforehand we would only use sketches and drawings, we were now able to get a visual representation of our piece in 3D, this was game-changing since we could focus and address problems quickly and efficiently. In addition, we were able to design and develop the piece in half the time it would usually take.