



Application Story

Engineering Collaboration Increases Precision, Reduces Assembly Time



Cleveland Deburring Machine Company (CDMC) designs and manufactures equipment for many different methods of deburring. They

needed a replacement gearbox for one of their existing deburring systems.

The existing design employed a large chuck for holding a part. A right angle gearbox rotated the chuck via a belt and pulley system. A second system was mounted remotely and used an air cylinder to open and close the jaws of the chuck.

Why GAM

Based on a trusted recommendation, CDMC contacted GAM for a replacement gearbox. CDMC was not looking to redesign the system, but GAM engineers saw potential for improvement. Before simply replacing the existing right-angle gearbox, GAM engineers reviewed the whole system and proposed a new design.

“The process of working with GAM to explain our requirements and our situation was excellent,” explained Adam Mutschler, owner of CDMC, “and we felt that they were able to understand what we needed to achieve. That’s what led us to move forward with this product.”

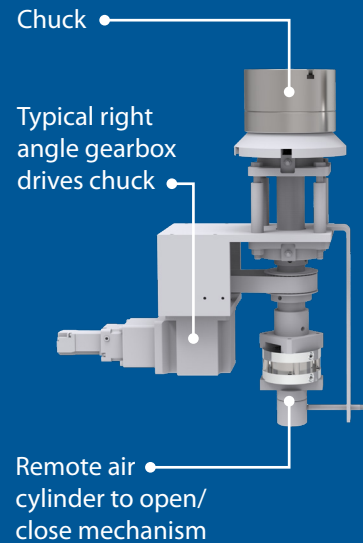
New Design

GAM engineers suggested replacing the right angle gearbox and belt and pulley with a GPL zero-backlash robotic planetary gearbox along with a custom shroud. With its large flange the GPL could directly connect to the chuck, eliminating the belt and pulley.

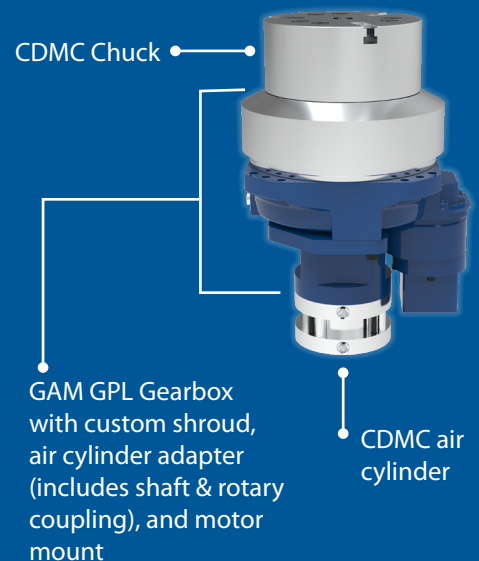
This still left the complicated mechanism for opening and closing the chuck. Taking advantage of the through hole in the GPL, GAM engineers proposed a custom adapter to mount the air cylinder to the GPL housing. In addition, GAM supplied a shaft with rotary coupling to connect the air cylinder to the chuck, allowing the cylinder to be stationary while the chuck rotated. This new design greatly simplified the mechanism.

With our engineering collaboration and custom value-add manufacturing capabilities, GAM was able to design and manufacture a complete solution ready for CDMC to mount the chuck, air cylinder, and servo motor

ORIGINAL DESIGN



NEW DESIGN



Application Story

Results

The new system improved performance as well as greatly reducing assembly time.

- With backlash less than 6 arcsec and vibration free motion, the GAM GPL gearbox made it possible for CDMC to **achieve the required precision** for the project which was not possible with the previous design.
- The new gearbox **reduces assembly time by 87%** from about 8 hours to about 1 hour. It also significantly reduced the size of the assembly for a more compact and cleaner look.

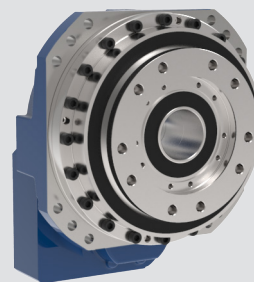
Adam Mutschler shared:

The new design allows for greatly increased precision and repeatability. This will allow us to utilize this improved design for the Zero-set deburring machines, but it also opens up the possibility for us to look at several new applications which would not have been feasible with the previous design.

The experience [of working with GAM] was great. The new ideas that were offered were incredibly helpful, and it's refreshing to have a supplier ask questions rather than trying to sell you on something regardless of fit.

Learn more about the GPL robotic gearbox at gamweb.com/gpl. Learn more about CDMC at cdmcmachine.com.

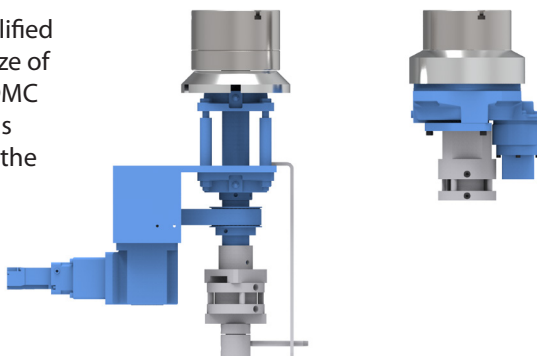
GPL Robotic Planetary The New Standard in High Precision Gearboxes



GAM's revolutionary GPL Series Robotic Planetary Gearbox combines the lowest backlash and high tilting rigidity with vibration-free motion for smooth, controlled motion in robotics and motion control applications.

- **Backlash ≤ 6 arcsec** (0.1 arcmin) for the service life of the gearbox
- **Lost motion ≤ 0.6 arcmin** best in market torsional rigidity
- **Vibration-free motion** for precise, smooth path control and continuous coordinated motion between the GPL-driven mechanism and another operation or mechanism
- **No adjustment necessary** backlash does not increase over gearbox lifetime

The new design (right) simplified and decreased the overall size of the mechanism allowing CDMC to consider it for applications previously not feasible with the old design (left)



Collaborate with GAM on your next application

GAM is a U.S. manufacturing company and your complete source for Robotic and Servo Gear Reducers, Rack & Pinion Systems, Servo Couplings, Linear Mounting Kits, and other precision mechanical drive solutions used in motion control and automation technology.

With a wide range of standard products as well as the engineering expertise and manufacturing capabilities to provide customized solutions, GAM can help with your motion control applications. U.S. manufacturing, being flexible to meet the needs of our customers, and great service are what set GAM apart from the rest.