

AUTOMATED ASSEMBLY CART

Brief Description:

Emerging Technologies, LLC. was called upon to design and build an automated assembly cart. The cart design was to include the ability to rotate clockwise and counter clockwise, as well as raise and lower to accommodate different product models and operator height and working preferences.

Emerging Technologies, LLC. developed a system utilizing powered linear actuators for work height adjustment, rotary gearmotor assembly for rotation, and a PLC for control. Additionally, an anti-tie down module, photo-eyes, and proximity switches were integrated to ensure safe operation of the assembly cart.

The rotating assembly rotates both directions stopping automatically at the "top" and "bottom" positions or manually at any point in the rotation by removing fingers from the finger switches. Similarly, the rotating assembly can be raised or lowered stopping and holding at any position over its eight-inch range.

The design package included bill of material, mechanical diagrams, electrical diagrams, and PLC software.

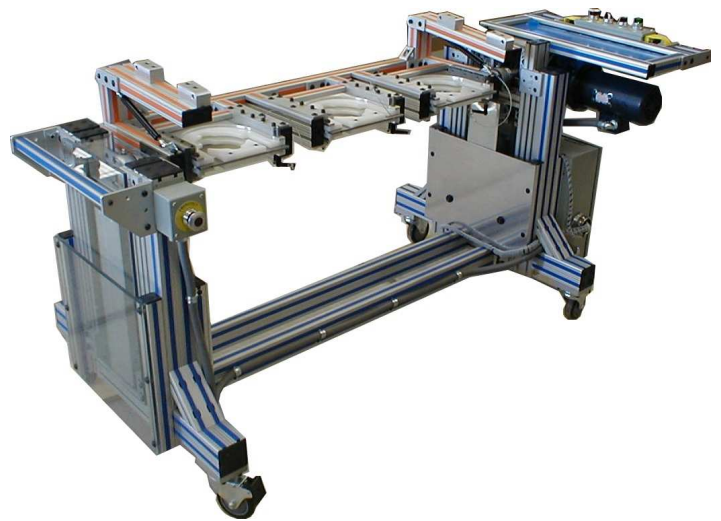
The assembly cart supports clamping, holding, and positioning of sub-assemblies for final assembly.

Customer Benefit:

The customer is able to clamp and position sub-assemblies for assembly of final product with adjustable height and rotation of the product under assembly. Additionally, the cart is made from lightweight aluminum and is mobile allowing for easy transport of completed product to the product testing area. The cart provides better working ergonomics and safety over the pre-existing process.

Special Features:

- Adjustable work height via linear actuators.
- Infinite stop and hold rotation (both CW & CCW).
- Anti-tie down for rotation.
- Photo-eye product detection to prevent rotation.
- Dual e-stop.
- Built in tool tray.
- Mobile design to accommodate completed product transport to testing.



Components Used:

- PLC.
- Linear Actuators.
- Right Angle Rotary Gearbox/Motor.
- Variable Speed DC Drive.
- DuoTouch Anti-tie Down.
- Custom sub-assembly clamps.
- Custom product positioning saddle.

Emerging Technologies, LLC.

Responsibilities:

- Functional Specification Generation
- ✓ Design / Engineering
- ✓ Fabrication
- ✓ Programming – Software
- Programming – Firmware
- ✓ Circuit & PCB Design
- ✓ On-Site Commissioning
- ✓ Post Commissioning Support
- Other

Technologies:

- Embedded Computers
- Microcontrollers
- Visual Software
- ✓ Control Software
- Data Acquisition
- Computer Based Control
- Communications – serial
- System Integration
- ✓ Other – PLC control

Customer Category:

- ✓ OEM
- Custom Equipment
- Utility
- R&D

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