The Project

The Stax Engineering team, along with the sponsorship of Masimo, has developed the Automated Tray Tacker & De-stacker with the intent to improve the efficiency of Masimo's production line. The machine's design is similar to a 3D printer, where it utilizes rotational motion and converts it into linear motion through the following steps:

**STEP 1**
- Operator handling trays
- Tray loading cart: full trays
- Destacker: full trays
- Stack: empty trays

**STEP 2**
- Destacker: full trays
- Stack: empty trays

**STEP 3**
- Destacker: full trays

**STEP 4**
- Stack: empty trays
- Tray loading cart: empty trays

Tray Stacker and DeStacker (TSD)

Engineering analysis was conducted on the platform, which is intended to hold a maximum of 100 N of force. Several different material options such as 7075 and 6061 aluminum in both 1/8 inch and 1/4 inch thickness were subject to Solidworks finite element analysis in order to determine the best possible material and thickness combination to support the maximum load of trays. The factor of safety was also accordingly calculated, which...

Main Components

- Custom Cart Plate
- m20 x 4mm Lead Screws
- Custom Tray Platform
- 1/4 in, 6061 Aluminum Platform Static chain
- 1/4 in, 6061 Aluminum Platform...

Systems Level Diagram

- Structure/Housing
- Electronics
- Mechanisms
- Connections
- Electrical connections
- Financial

The Team

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