CARSON SHELLENBERGER

MECHATRONICS ENGINEER * R&D + MANUFACTURING * MED DEVICE

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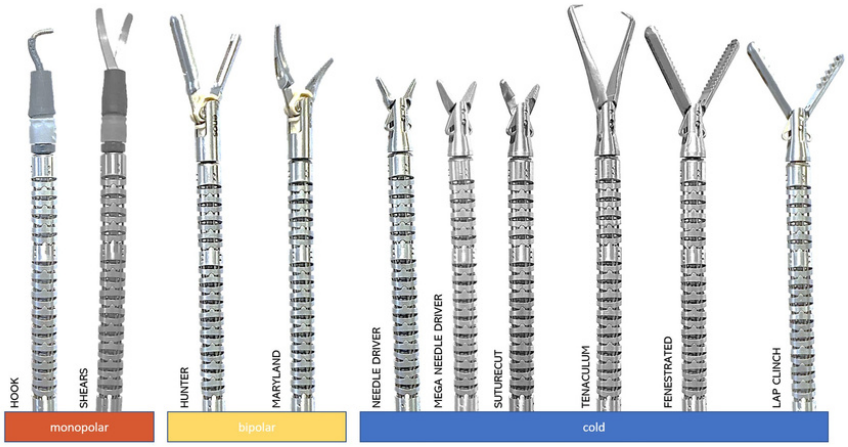
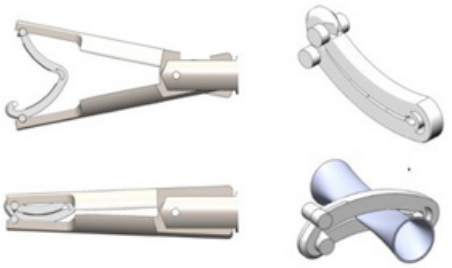
DESIGN PROJECTS

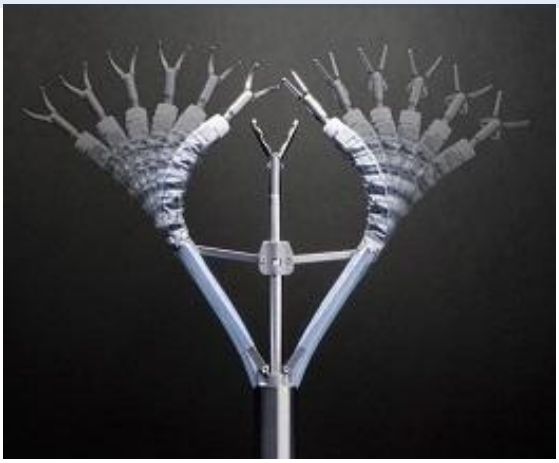
FLEXIBLE ROBOTIC SURGICAL INSTRUMENTS - TITAN

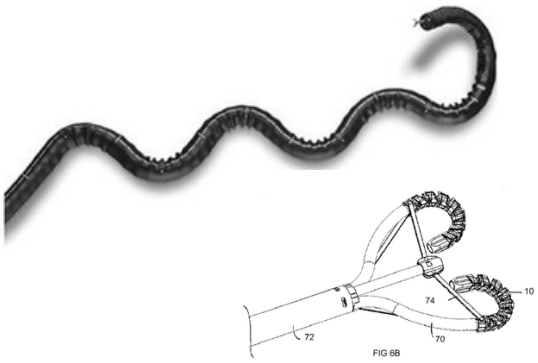


IMPLANTABLE LIGATING CLIPS + APPLIERS - TELEFLEX

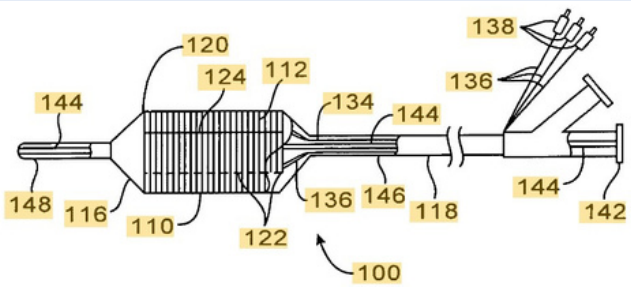


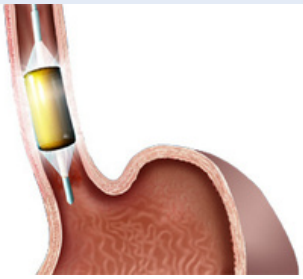
STEERABLE FLEXIBLE MANIPULATORS FOR SURGICAL ROBOTS - MULTIPLE





BALLOON CATHETER + RF ELECTRODE - STELLARTECH





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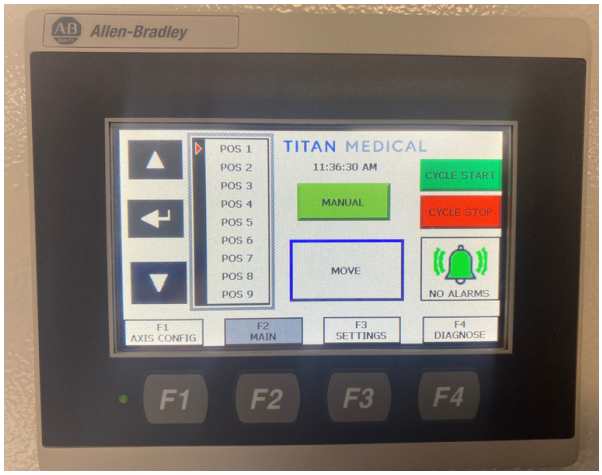
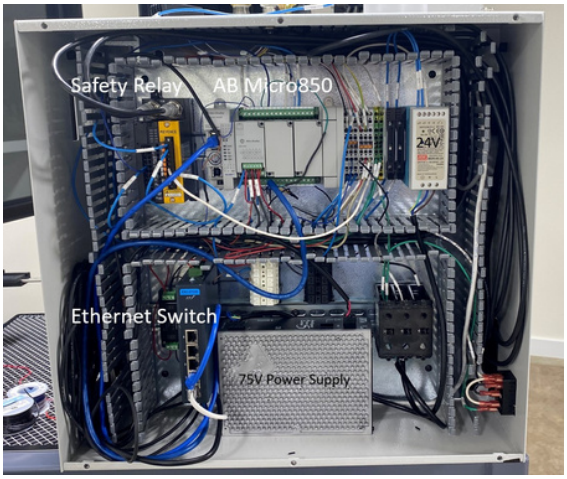
AUTOMATION PROJECTS

AUTOMATED PNEUMATIC PRESS

MANUFACTURING





What

- Design, fabricate, and program a fixture to automate the crimping process for surgical instruments

How

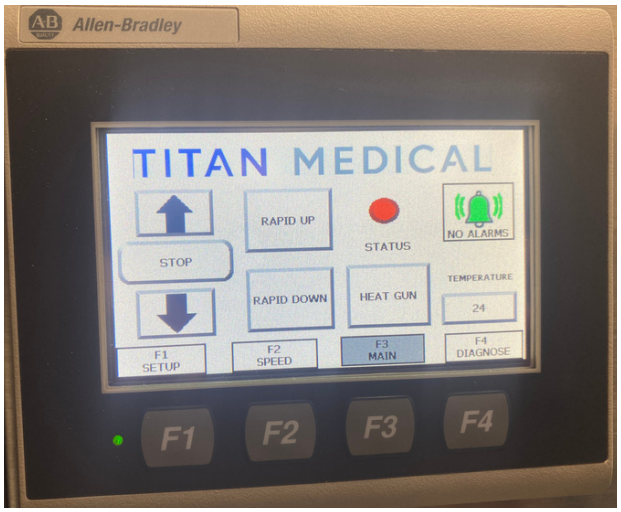
- Mechanical Design - Solidworks
- OTS Press from Janesville
- Clearpath servo positioner
- Keyence Light Curtain + Sensors
- Allen Bradley PLC + HMI
- Ladder Logic control

Results

- Press implemented in production,
- Over 300 instruments
- Crimp position repeatability of +/-.002"

AUTOMATED HEAT SHRINK STATION

MANUFACTURING



What

- Reduce amount of time it takes to fill tubes with oil
- Minimize human operator error

How

- Mechanical Design - **SolidWorks**
- 2-Axis Servo Control
- Automatic Shutoff
- Hardware - AB Micro 850 + HMI
- Software - Ladder Logic

Results

- No plastic part deformation
- Eliminated high risk failure mode
- Improved manufacturing throughput - Walk Away

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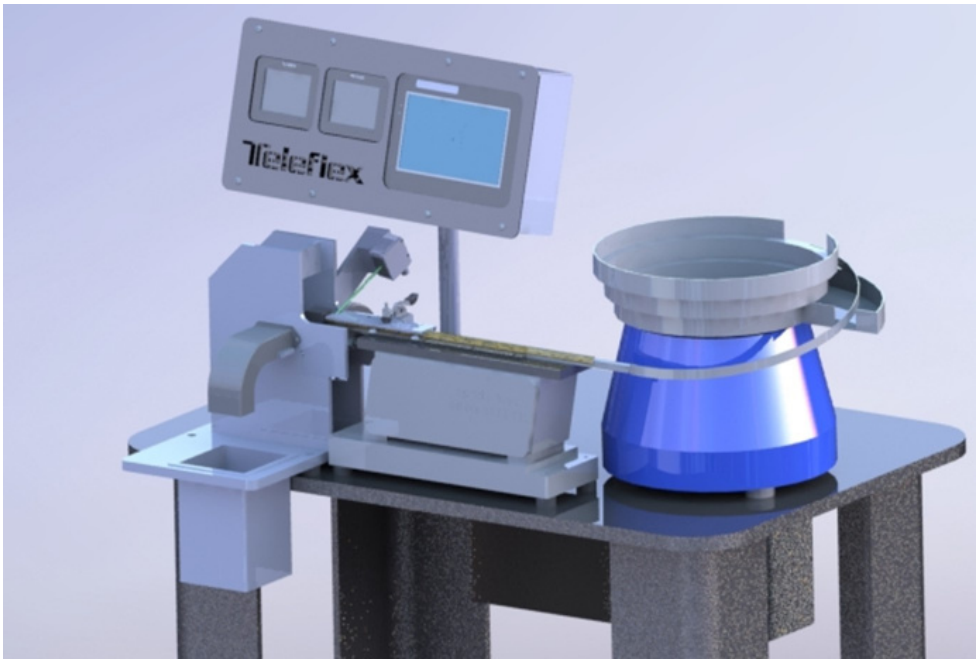
AUTOMATION PROJECTS

VISION INSPECTION OF LIGATION CLIPS

MANUFACTURING



- Bowl Feeder
- linear Rail
- Pneumatic Pick and Place
- Vision Inspection from 2 Angles
- Automatic sorting system
- Machine + Vision HMI
- PLC Controlled

What?

- Create an inspection system for Implantable Ligation Clips
- Must be compatible with high volume production 1M/mo

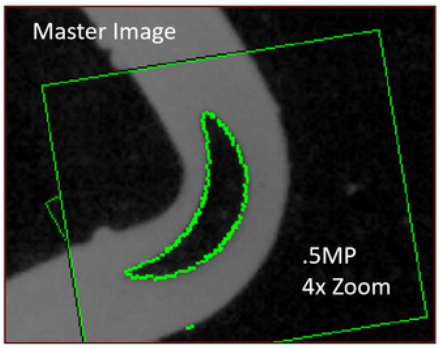
How?

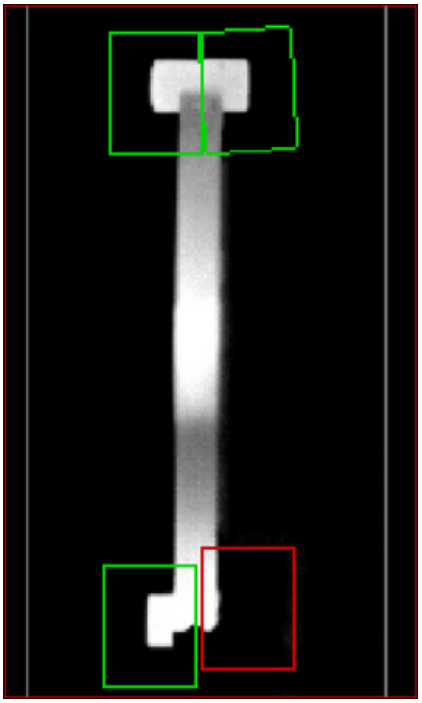
- Component Design - Solidworks
- PLC + HMI - Allen Bradley Micro850
- SW - Ladder Logic
- Vision System - Keyence

Results

- Working prototype that caught 99% defects

BOWL FEEDER (AUTOMATION DEVICES) + VISION SYSTEM (KEYENCE)





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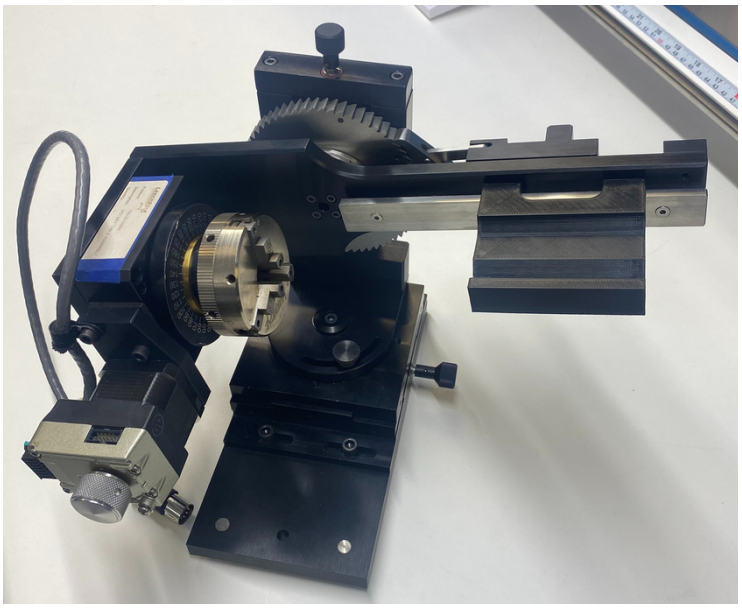
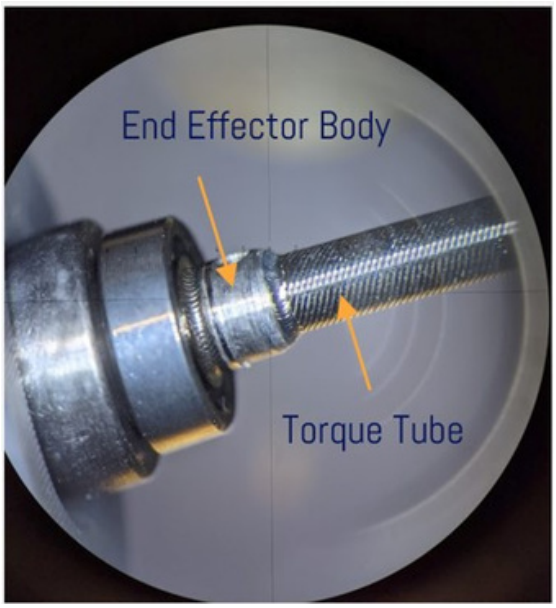
SIMPLE MANUFACTURING FIXTURES

LASER WELD ROTARY STAGE



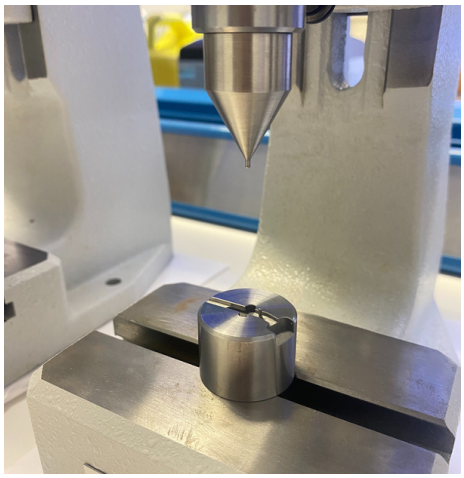


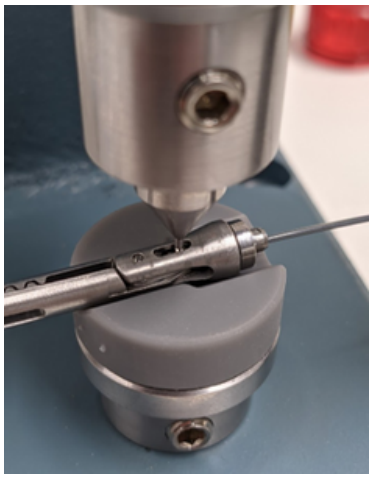
What
- Create a fixture to rotate a sensitive assembly during laser welding
- Manual insertion, automated rotation

How
- Comopnent Design - Solidworks
- Control - M-Drive Stepper
- Laser Welder - LaserStar

Results
- Implemented in pilot production & used on 100% of devices built

MANUAL PRESSES WITH CUSTOM TOOLING





What
- Create a set of simple manual presses for multiple assembly operations on the production line

How
- Design - Solidworks
- Presses - Schmidt
- Tooling - Custom made by local machine shop

Results
- Implemented in pilot production & used on 100% of devices built