

*Welcome to*

Advanced Textiles

**EXXPO**

ORGANIZED BY 







# ORANGE COUNTY CONVENTION CENTER

## NOVEMBER 1-3, 2023





***Shaping***

***The FUTURE*** TOGETHER...

How ***AUTOMATION*** ***TECHNOLOGY***  
*and* ***INNOVATION*** *are* ***CHANGING***  
*our* ***INDUSTRY***

***Frank Henderson***

Advanced Textiles

**EXPO**

**Supply chains** today have been disrupted more in the last few years than at any time in our history and will remain unstable, within the textile supply base, until we understand **Local for Local** manufacturing, **Automation Integration** and **Technology Innovation** as not simply, relentless obsessions in chasing low-cost goods, expensive carbon footprints and long order lead times.

**Robotics, Technology and Automation** can Help our industry attain the real objective of **DRIVING PROFITS, SUSTAINABLE GROWTH, SUSTAINABILITY AND CIRCULARITY** of Textile Products within the textile value chain.

**... Robotics Integration into Sewn Products IS Possible Today**

**... Shortened Order Lead Times are Possible**

**... Over Production is Not Acceptable today**

**... Sustainability and Circularity of Textile Products is Attainable**

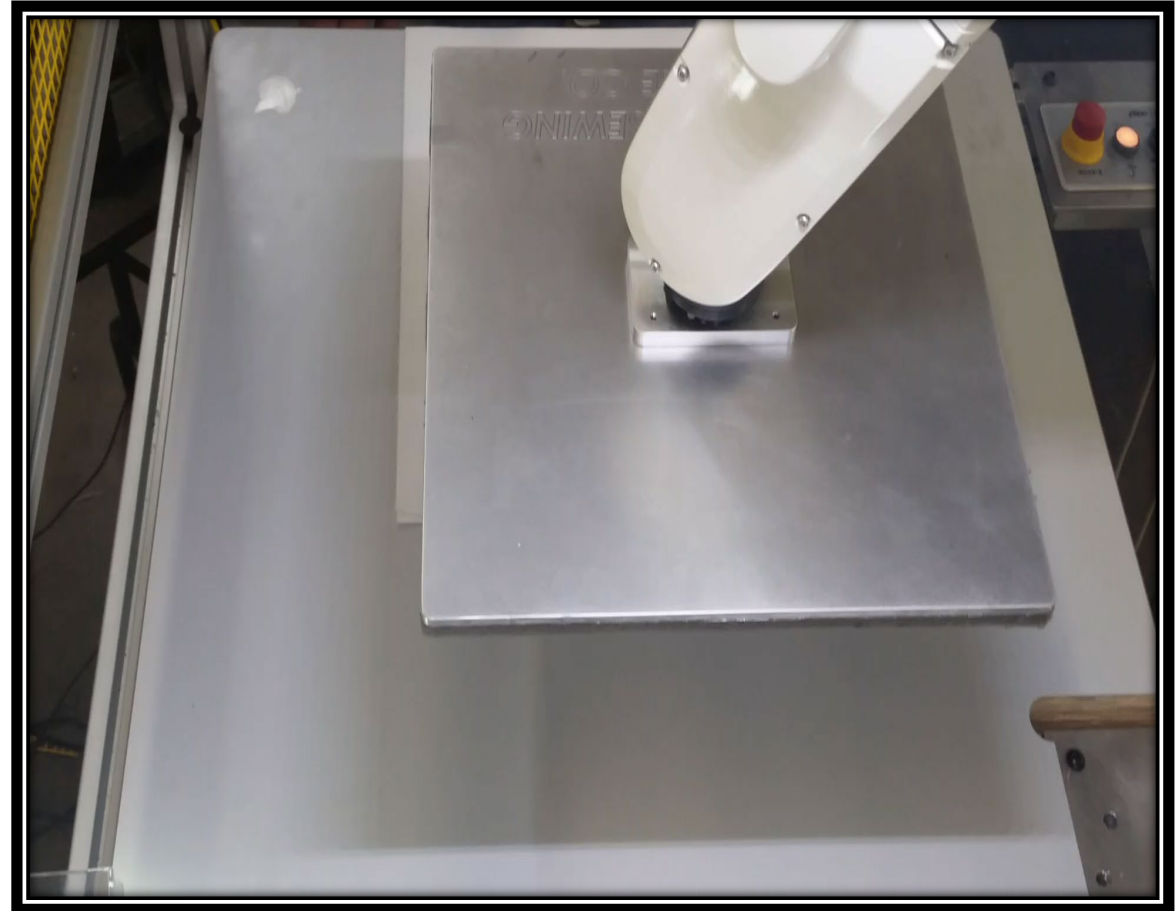
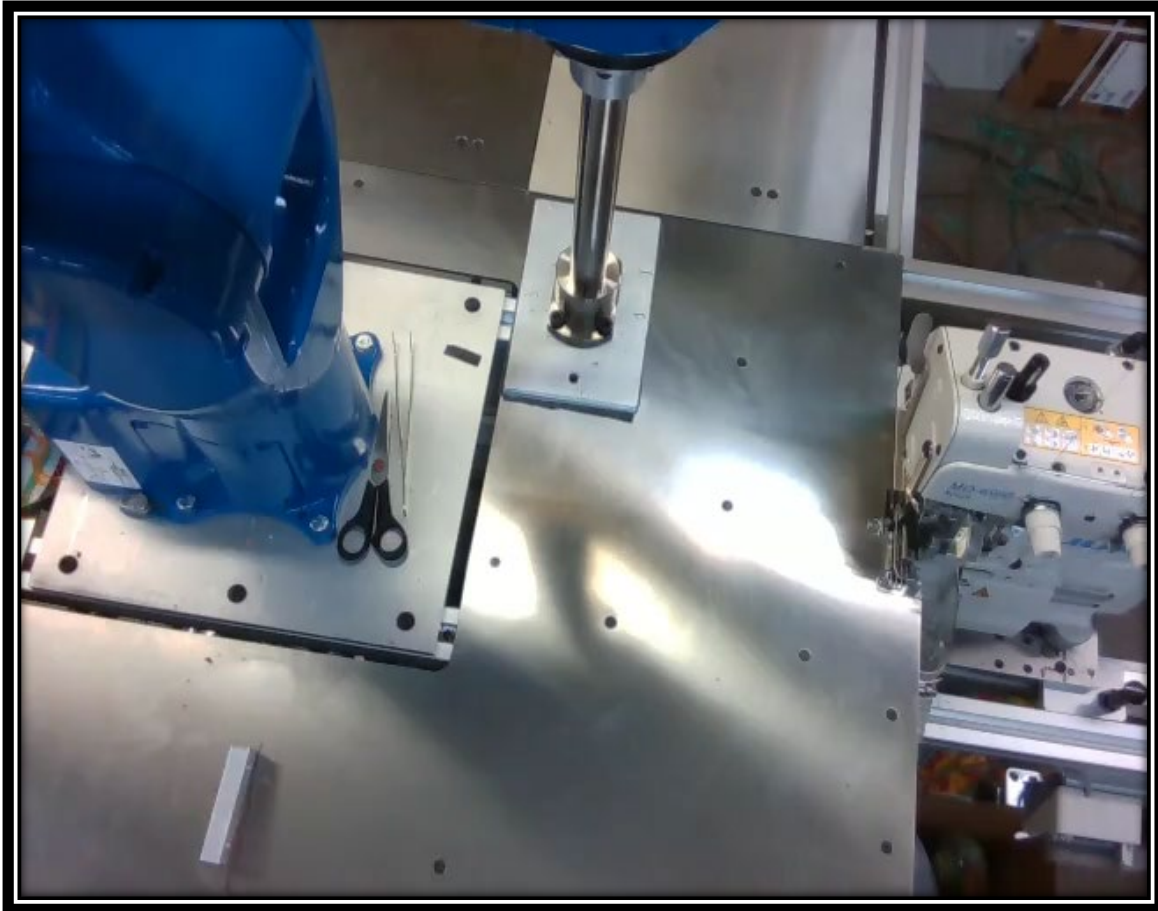
**... Finding & Retaining Labor is an Issue Today**

Advanced Textiles

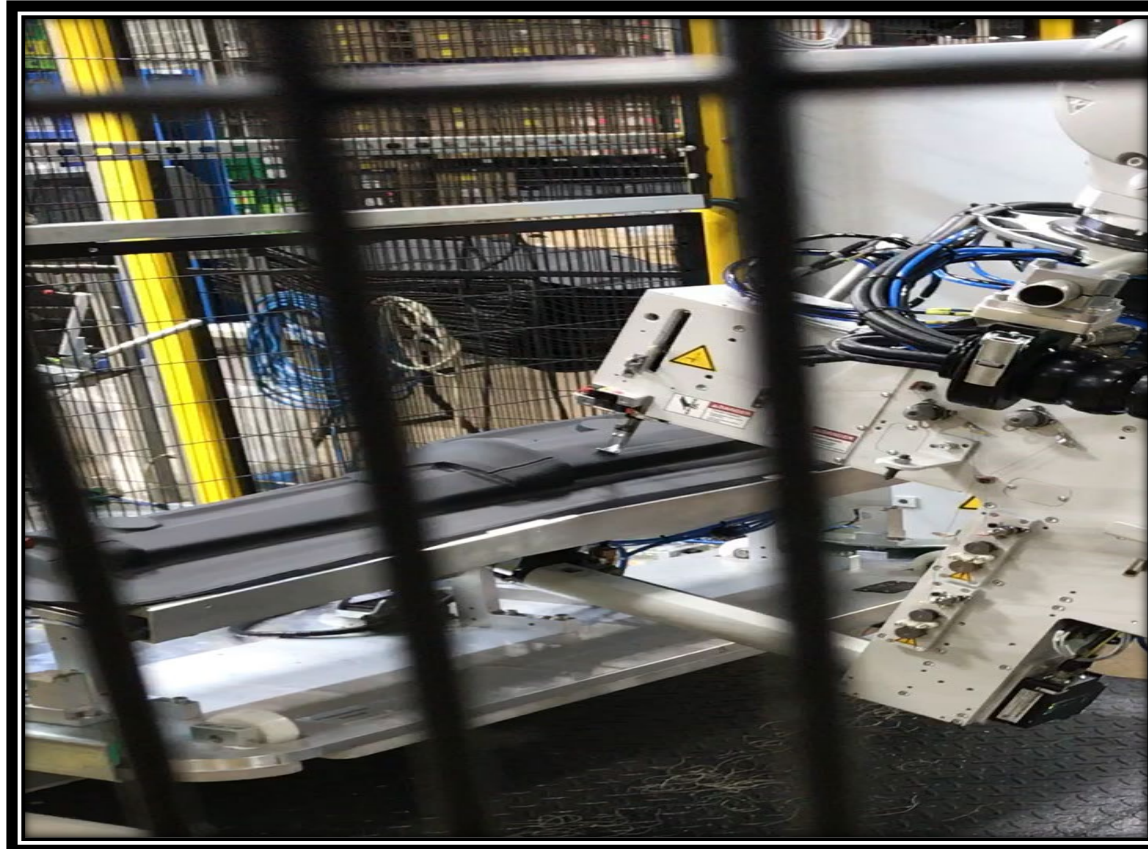
**EXPO**



# ROBOTS Integrated into *SEWING*



# **ROBOTS** **Integrated** **into** **AUTO SEWING**



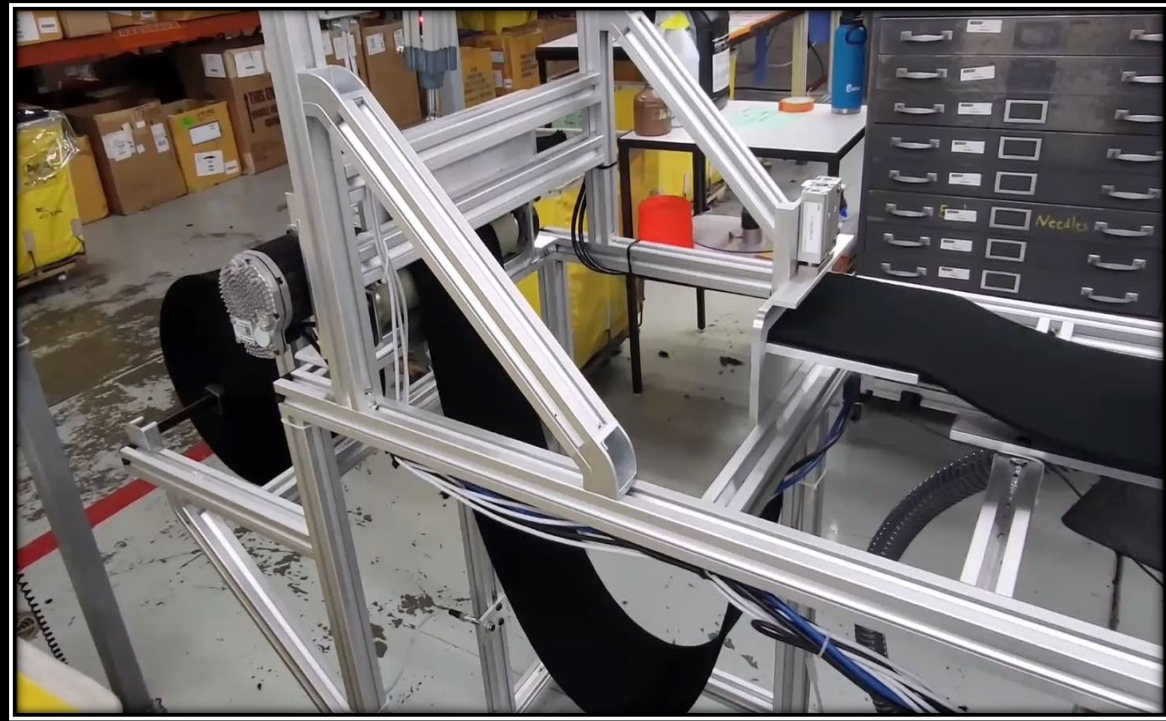


# ROBOTS Integrated into *SEWING*





**Automation  
to  
Manufacture  
Beanies**



***Beanie, Feed  
Cut & Turn***



High Efficiency

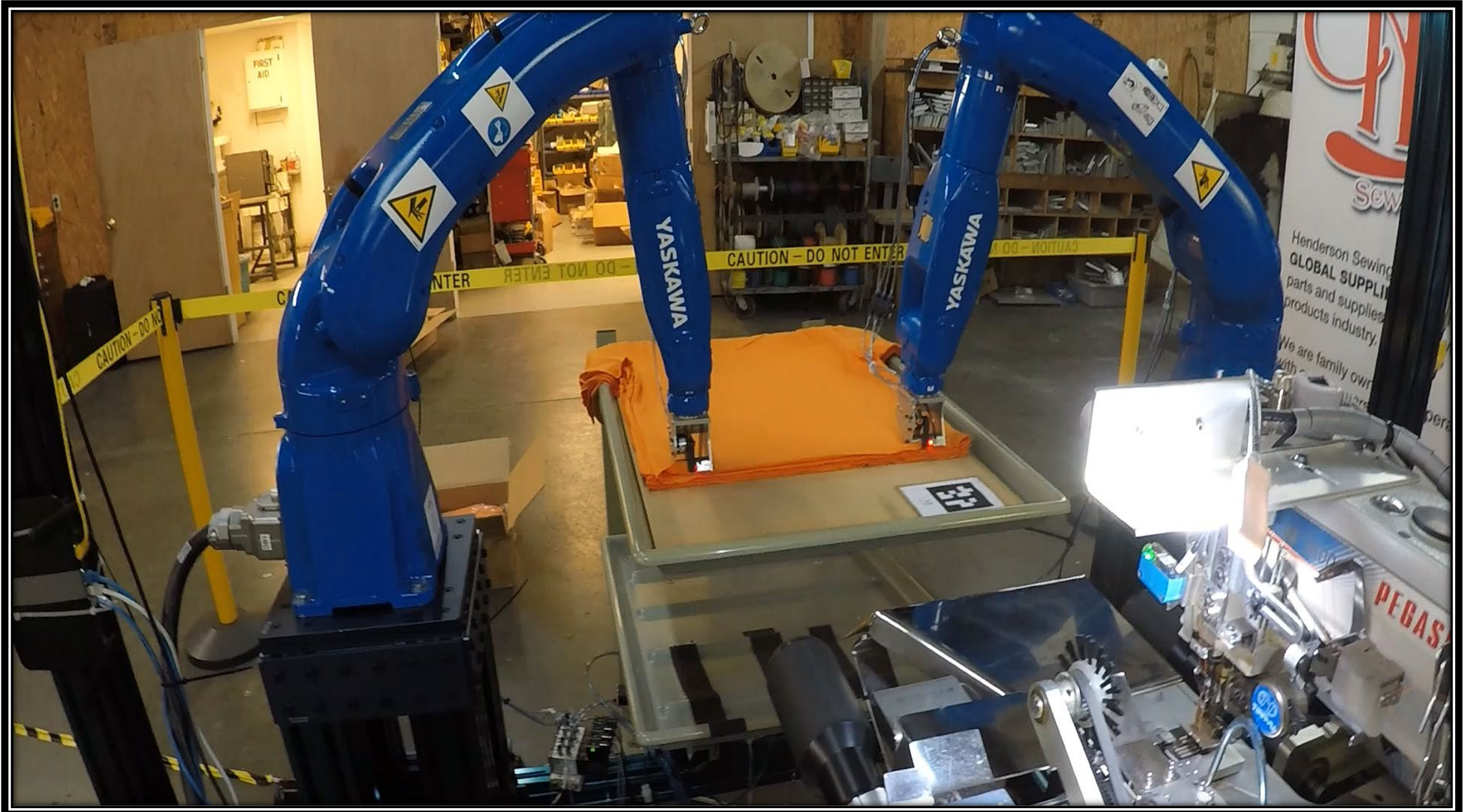
**Beanie Robotic  
Auto Sew**



**Beanie Robotic  
Auto Sew**



# ROBOTIC LOADING T-SHIRT





# solar**edge**

## Automation Machines

*For BANNERS, MATS,  
FLAGS ...*

*Large Panel JOINING*







**solar**edge

Automation Machines

***For BANNERS, MATS,  
FLAGS ...  
Large Panel Cutting***



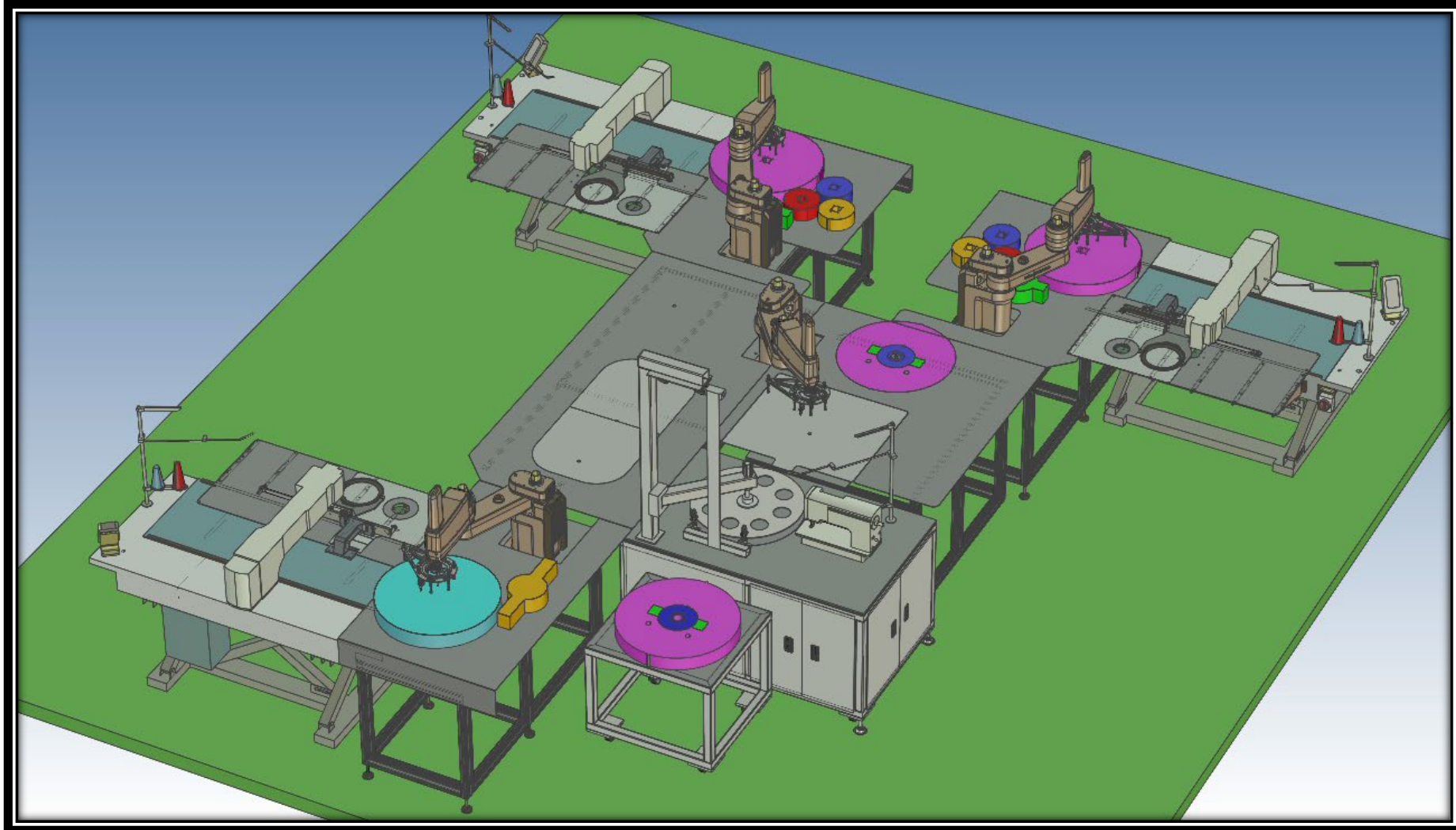
# *Synchronized Sewing Heads*



**AIR BAG PRODUCTION**



# ***ROBOTIC SIMULATION of AIR BAG PRODUCTION***



# ROBOTIC MACHINES



**FURNITURE GANTRY ROBOT**



**ULTRASONIC CUT & SEAL**

*Material Handling ... WITH Automation*



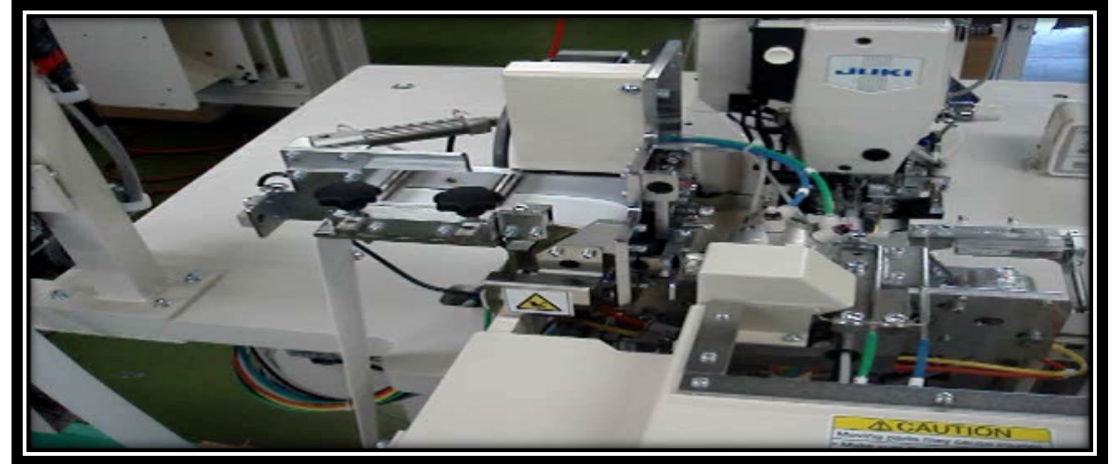
# Automated Machines *and* Robots



**ROBOT - Ironing Board Covers**

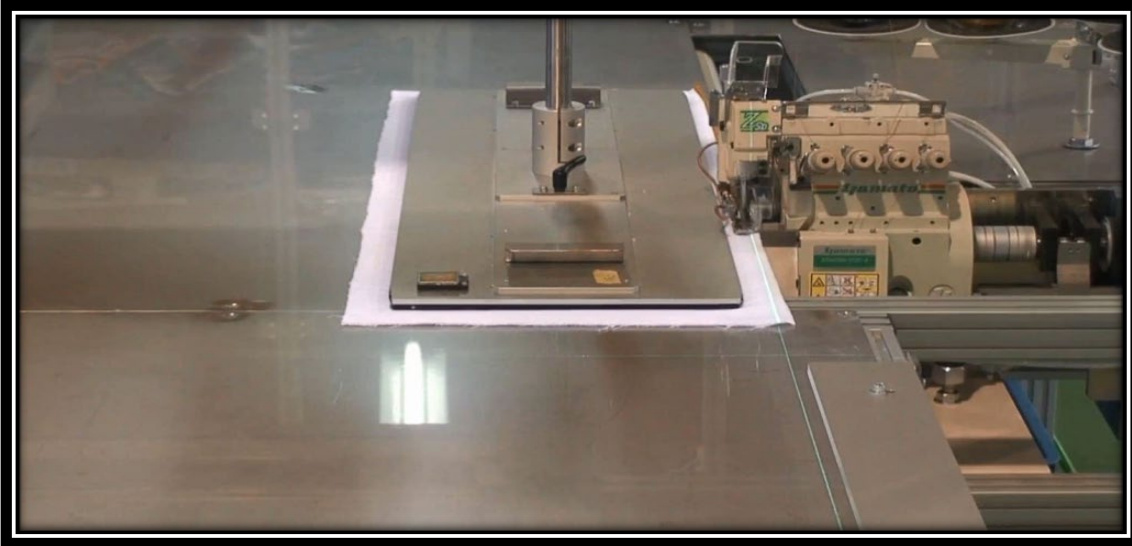


**ROBOT - Auto Air Bag Operation**

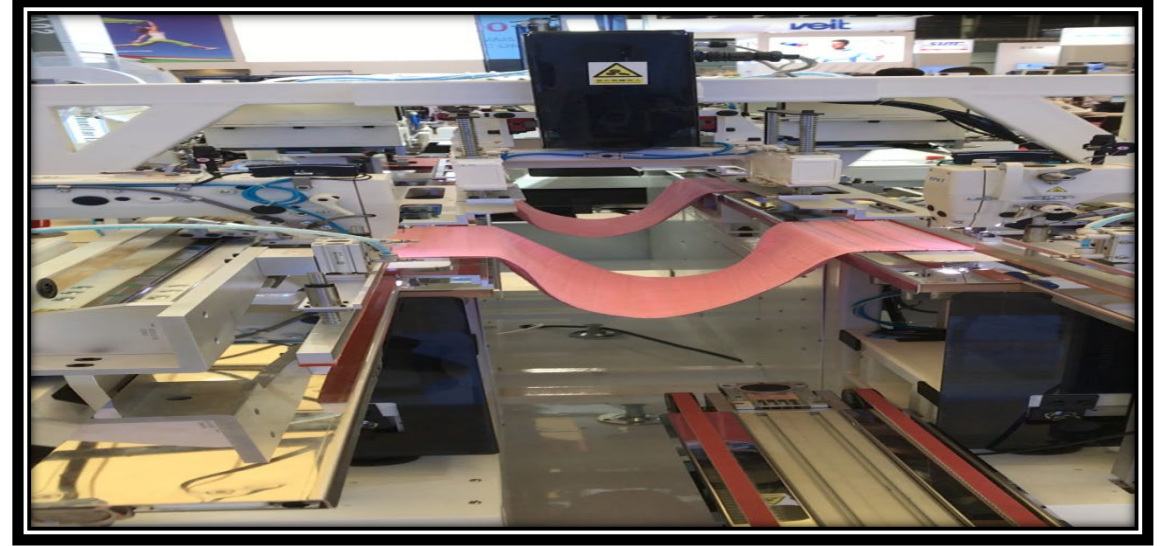


**Auto Elastic Ring**

# Repetitive Motion Manufacturing



Robot Towel Sew



Towel Edge Sew



Robot Auto Head Rest



Dual Arm Robot Assembly

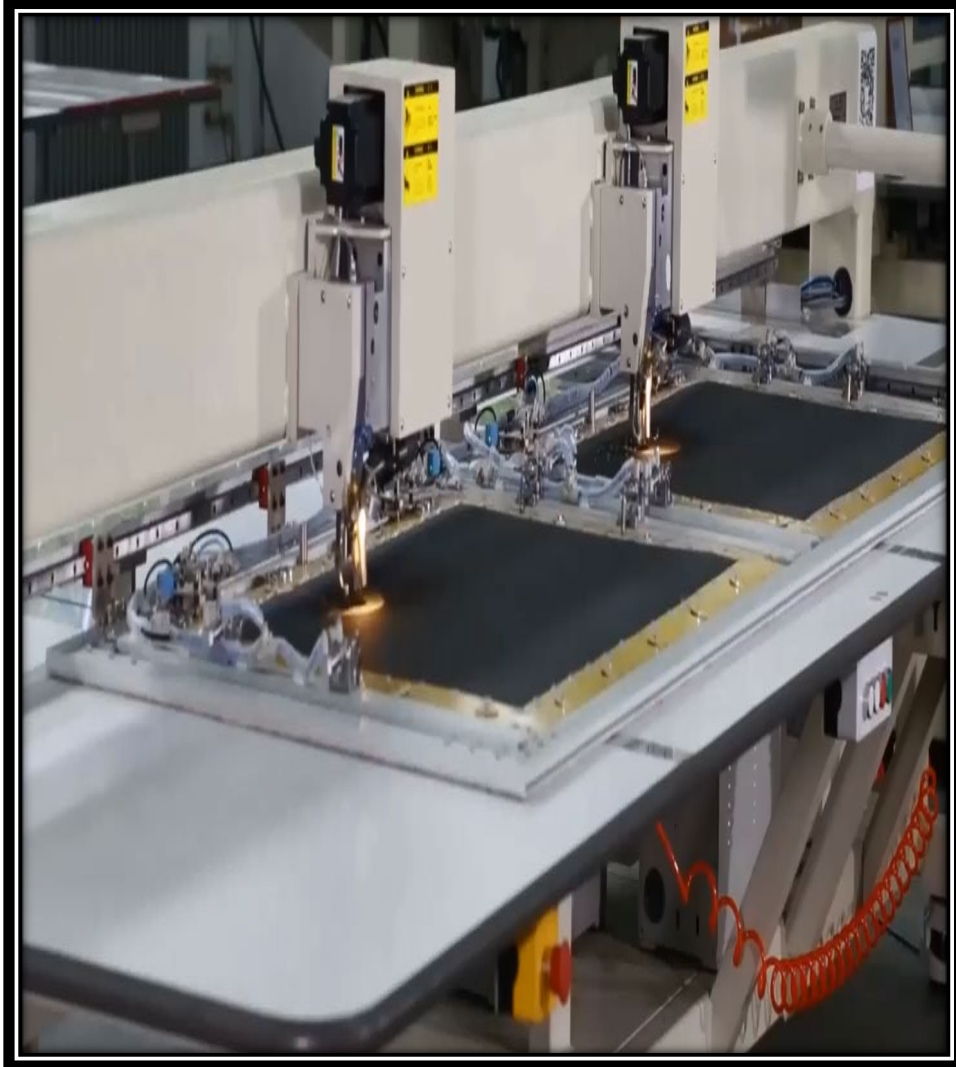


# **XY THETA TURNING HEAD**



**Sewing Areas from 600mm X 600mm to  
42 Feet Long X 6 Feet Wide**

# Automatic Sewing



**Perforation & Sewing**



**CNC Programmable**



Say Hello to  
Digital Thread Dyeing

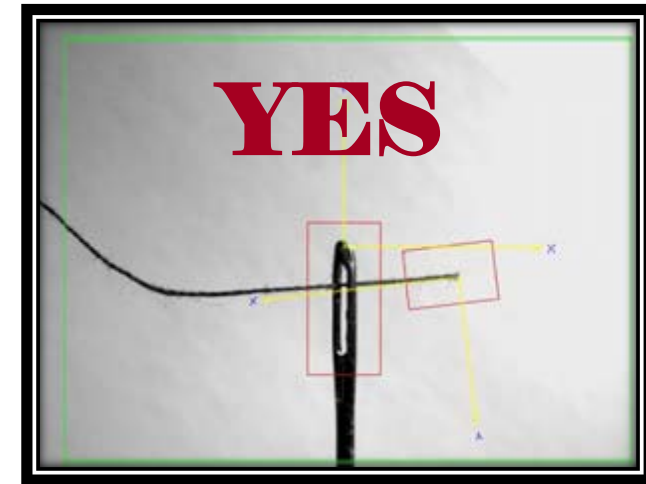
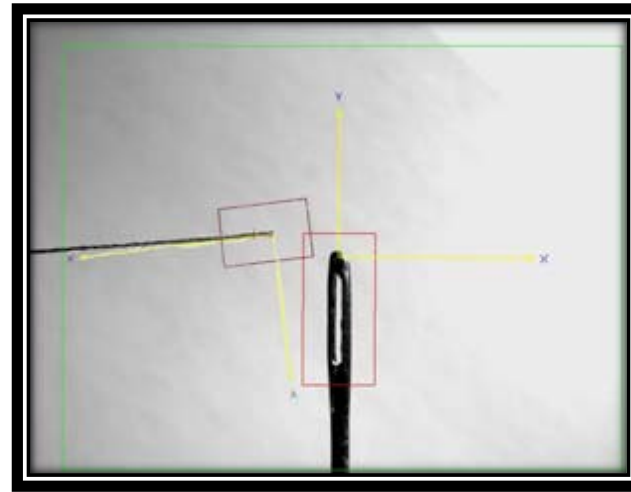
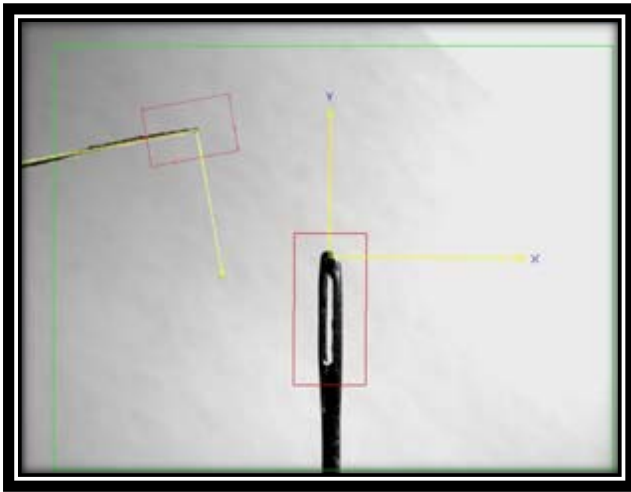


  
The fiber of digital textile



# VISION SYSTEMS INTEGRATION INTO SEWING

## Can Vision be Used to Thread a Needle?



*Visual Servoing – System Captures Multiple Images and determines the relative distance between the part and the target. A series of incremental motion commands are executed until vision confirms the task is accomplished*



# VISION SYSTEMS INTEGRATION INTO SEWING



## VISION "DIRECTED" SEWING

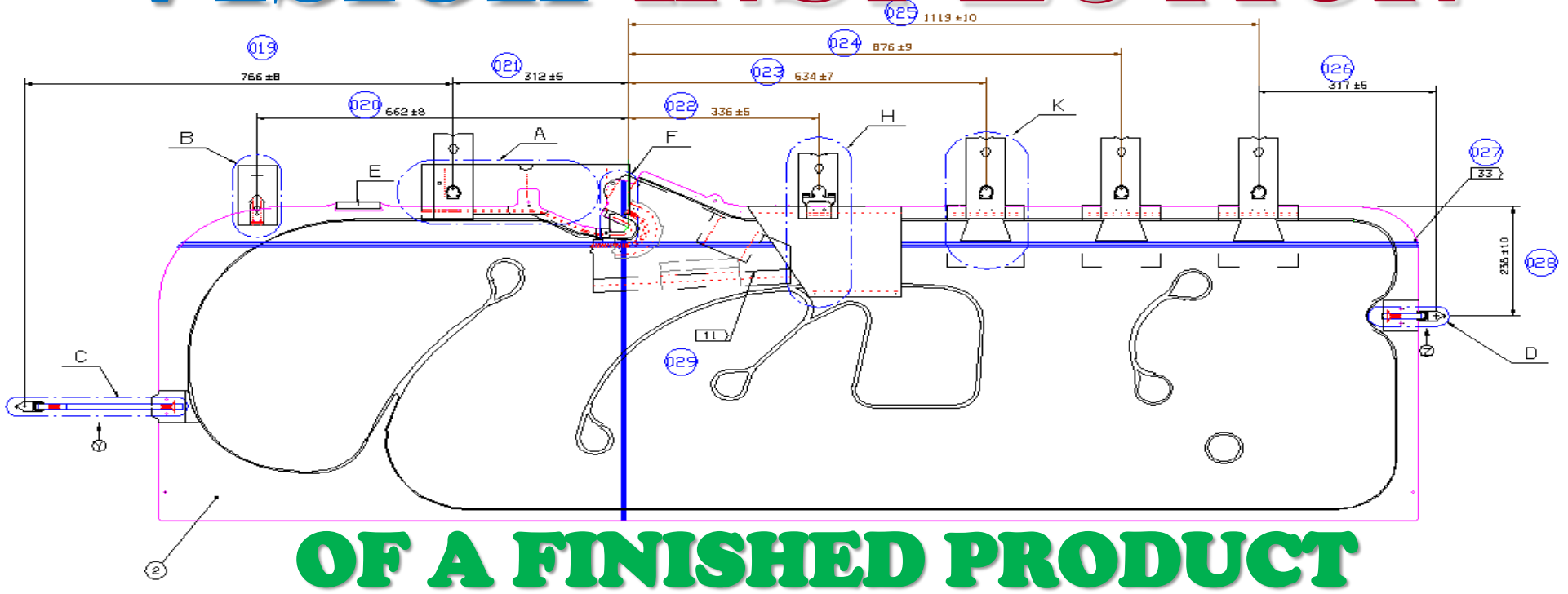
The **system** is designed using the programmable **PC Custom Camera** and lighting to automatically **Create a Stitch Pattern** around **irregular shaped objects** like Patches, Labels, Appliqués, Letters, Numbers, etc.

# Vision Alignment & Inspection Of Products

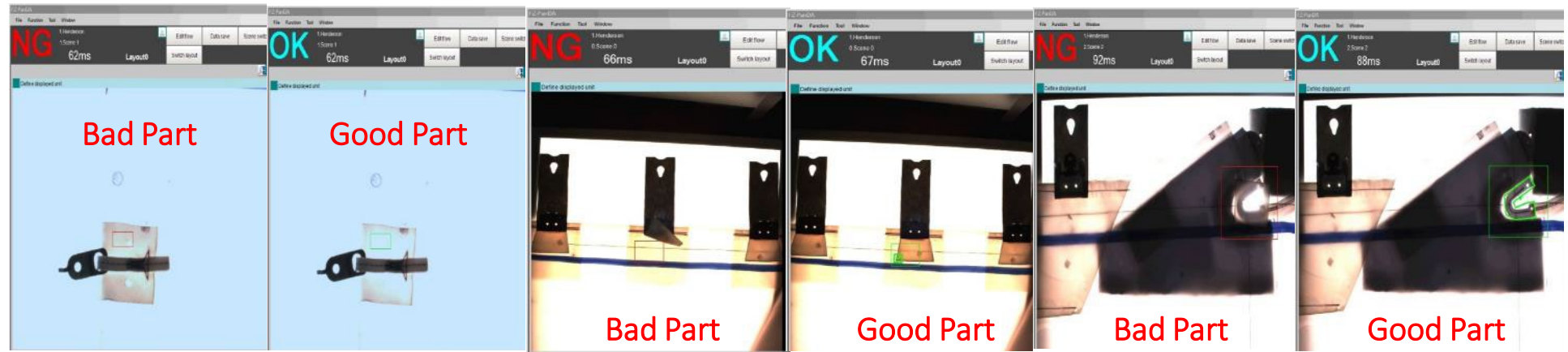




# Vision INSPECTION



## OF A FINISHED PRODUCT



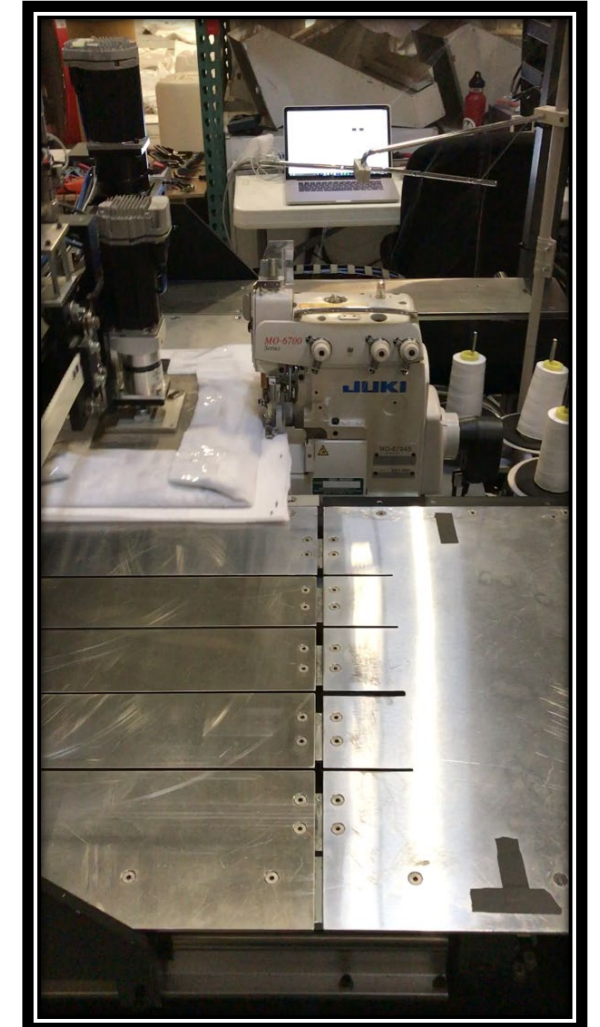
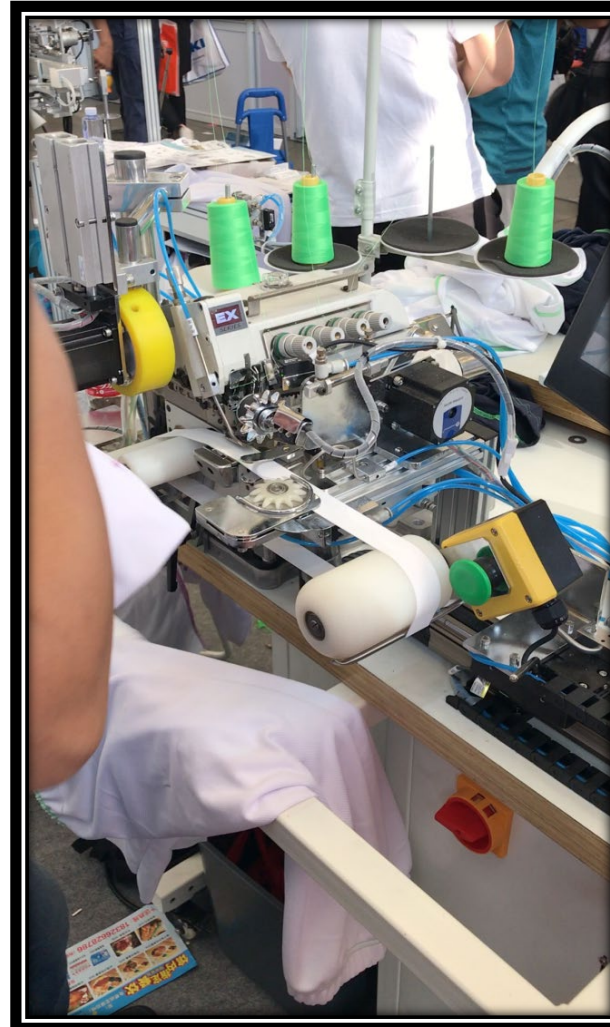
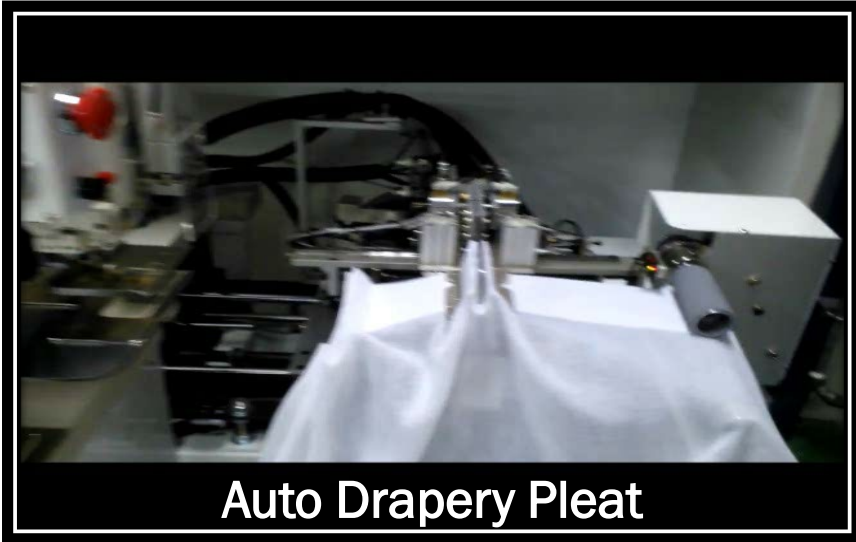
# Automated Machines For SPECIFIC OPERATIONS



**"Autonomous" Work Cell Sewing**

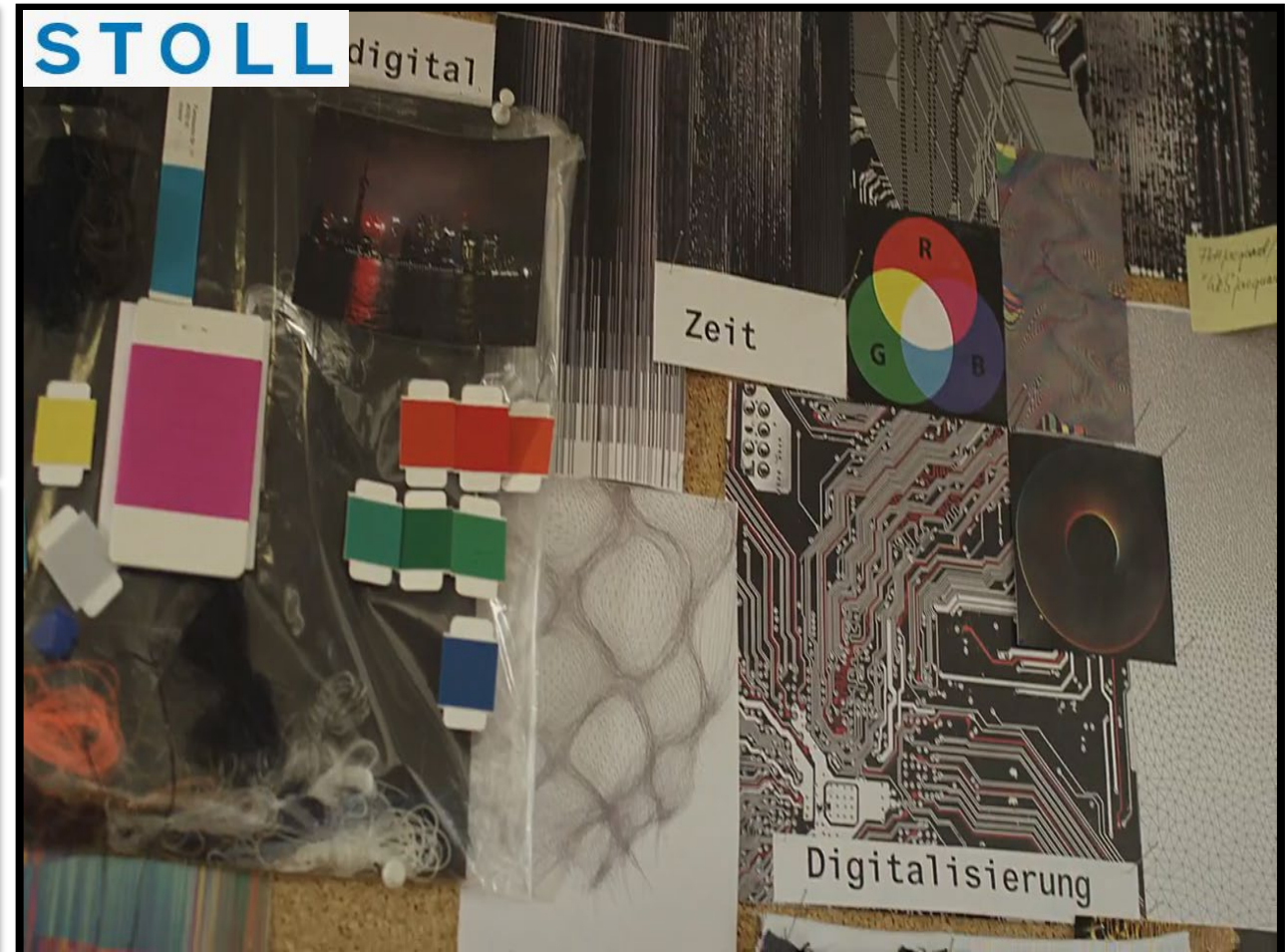


# Repetitive Motion Sewing





# YARN *to* Automated Machine *TO* Completed PRODUCT



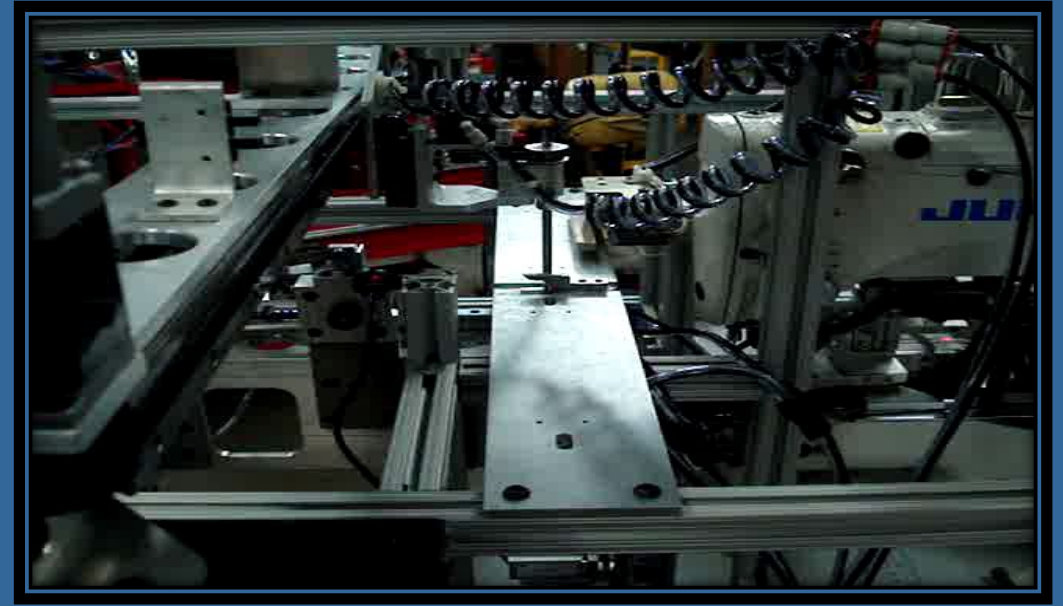


**YARN** *to* **Automated Machine**

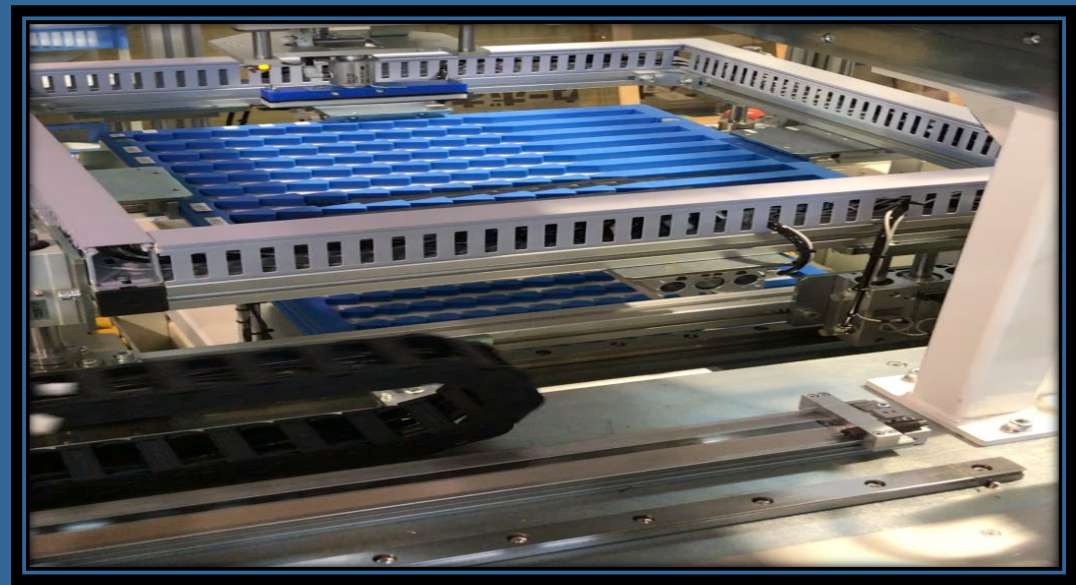
*TO* **SHOE UPPER**



# **AUTOMATION** *and* **TECHNOLOGY**



**BECKETT LINE CORD Automation**



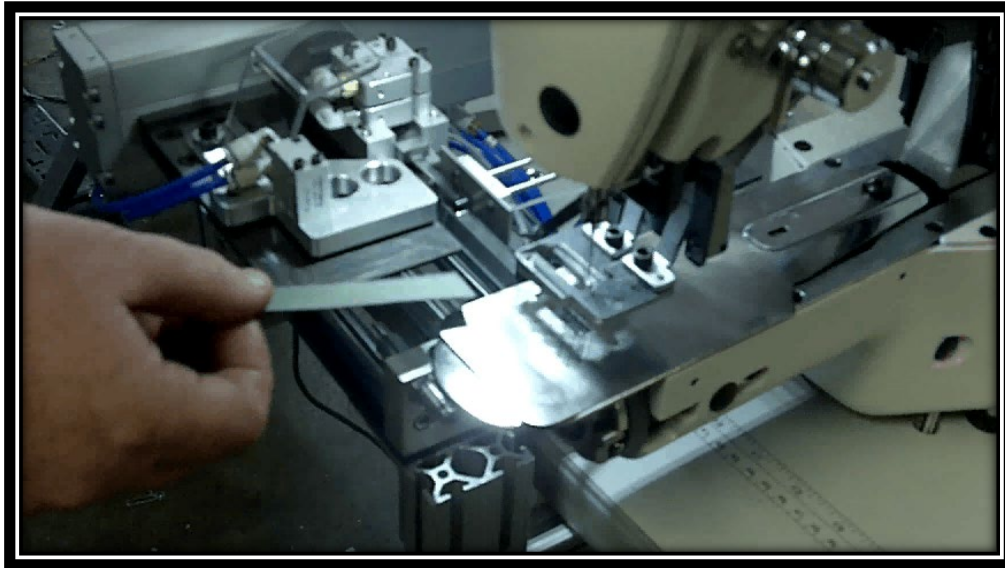
**JEANS ZIPPER ATTACH**



**JEANS INSEAM Automation**



# Work Cell Automation



Parachute Line Cord Automation



Twin Head, Auto Velcro Loading, Medical Unit



Webbing End, Turn and Tack



Bottom Velcro Load with Name Tape on Top

# *PRODUCT SPECIFIC*

# *AUTOMATION*

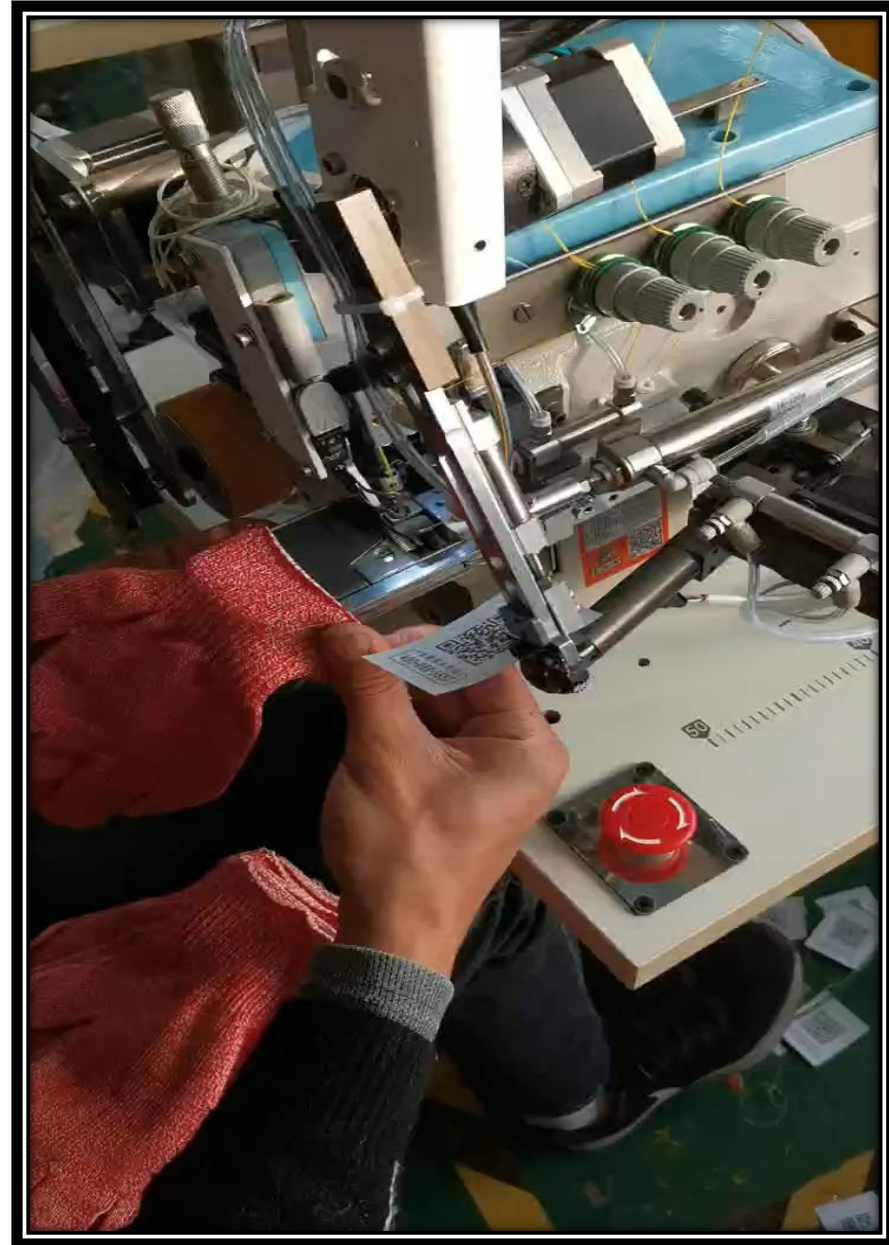
**WEB END TURN & TACK**

**SEAT BELT PIN INSERTION**





# GLOVE HEM WITH LABEL INSERTION





**Operation 1**



**LEAN PILLOW LINE**

**Operation 2**



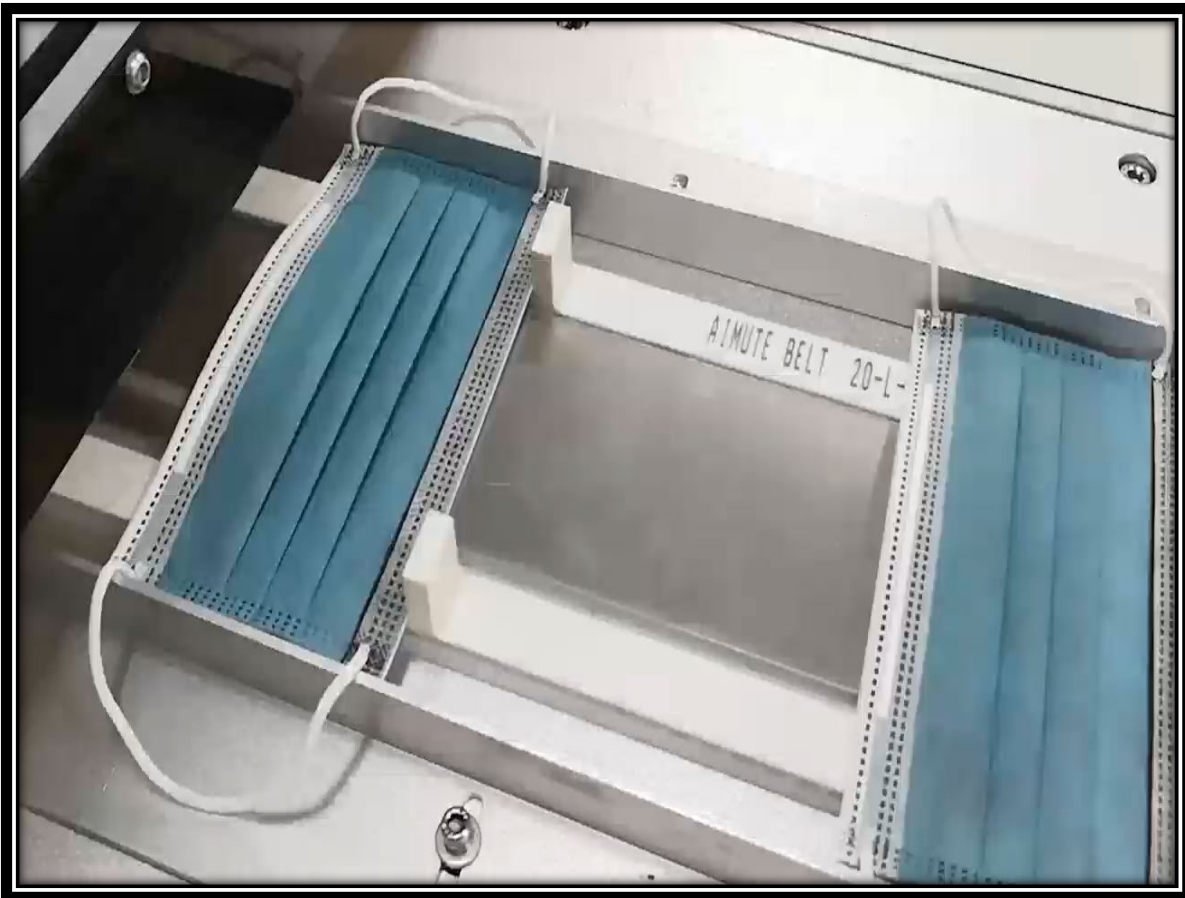
**U-LEAN LINE  
Example**



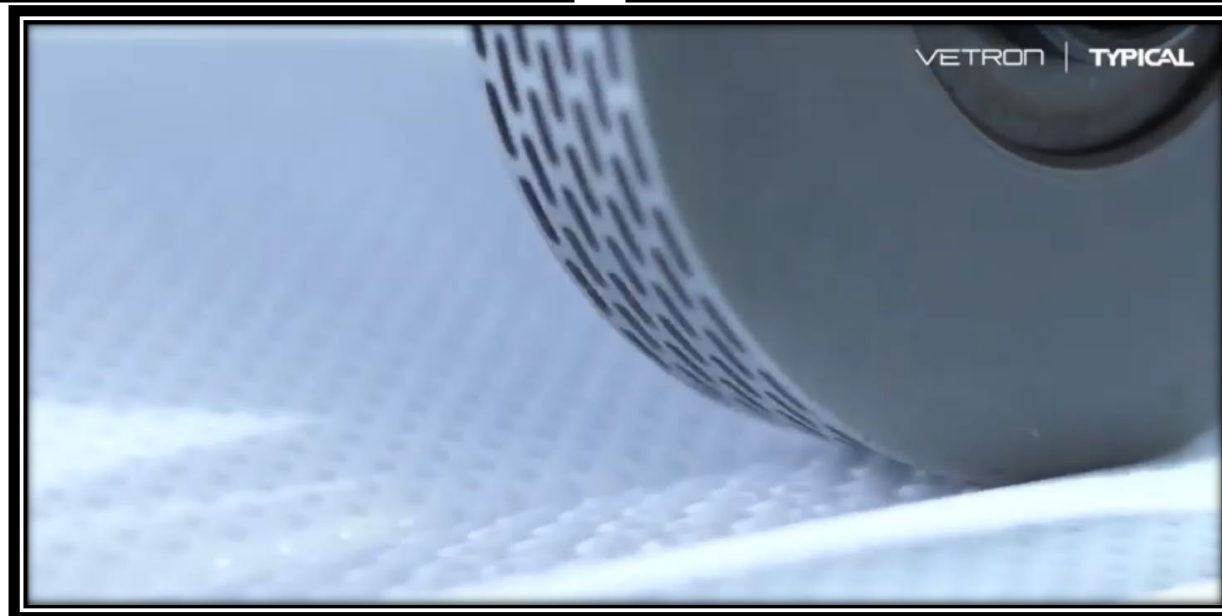
**Straight LEAN LINE  
Example**



# **AUTOMATIC** **FACE MASK** **MACHINES**

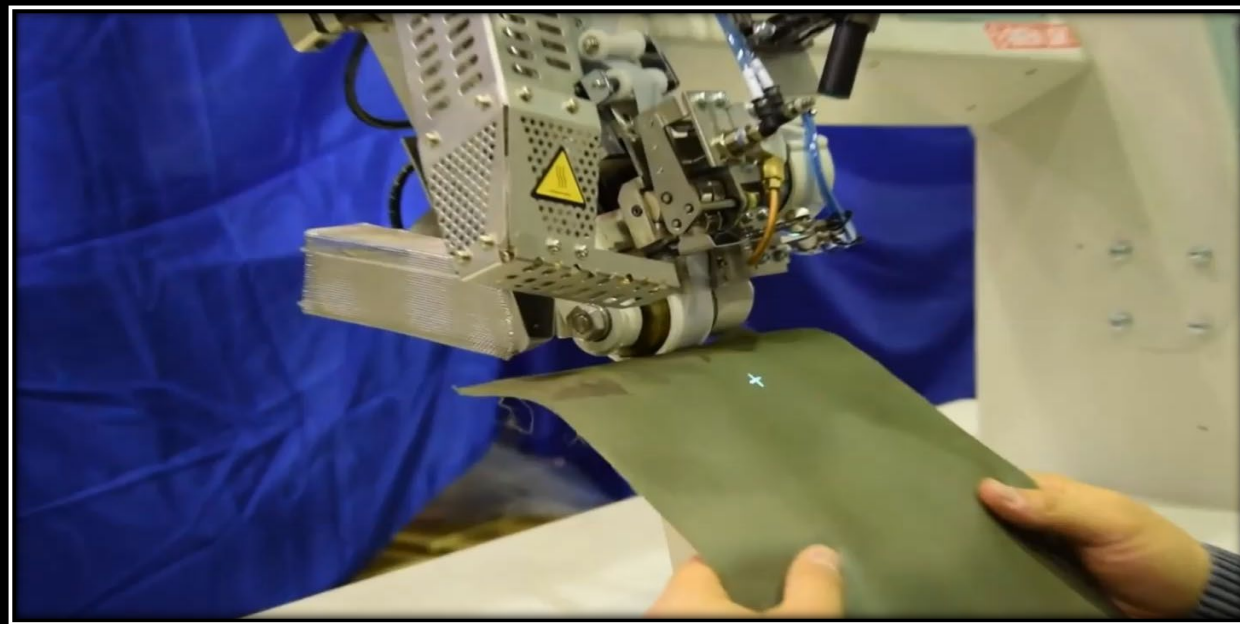
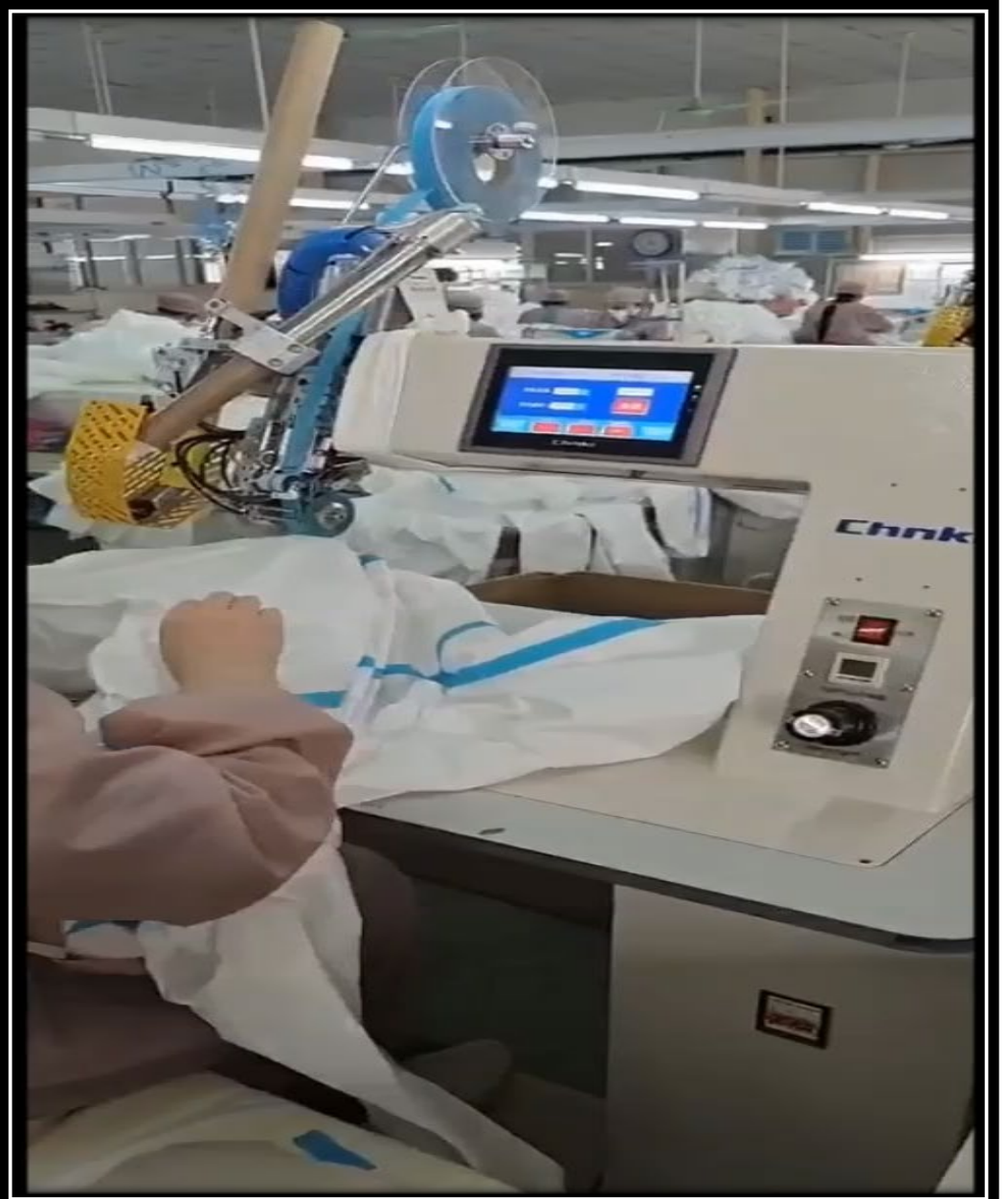
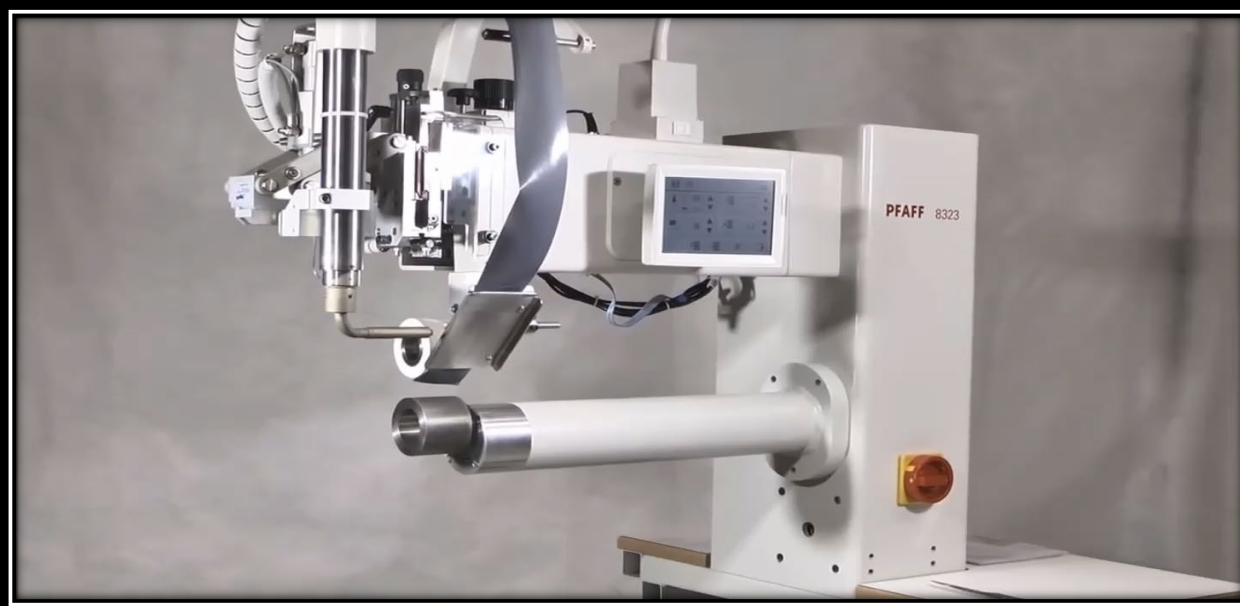


# ULTRASONIC WELDING

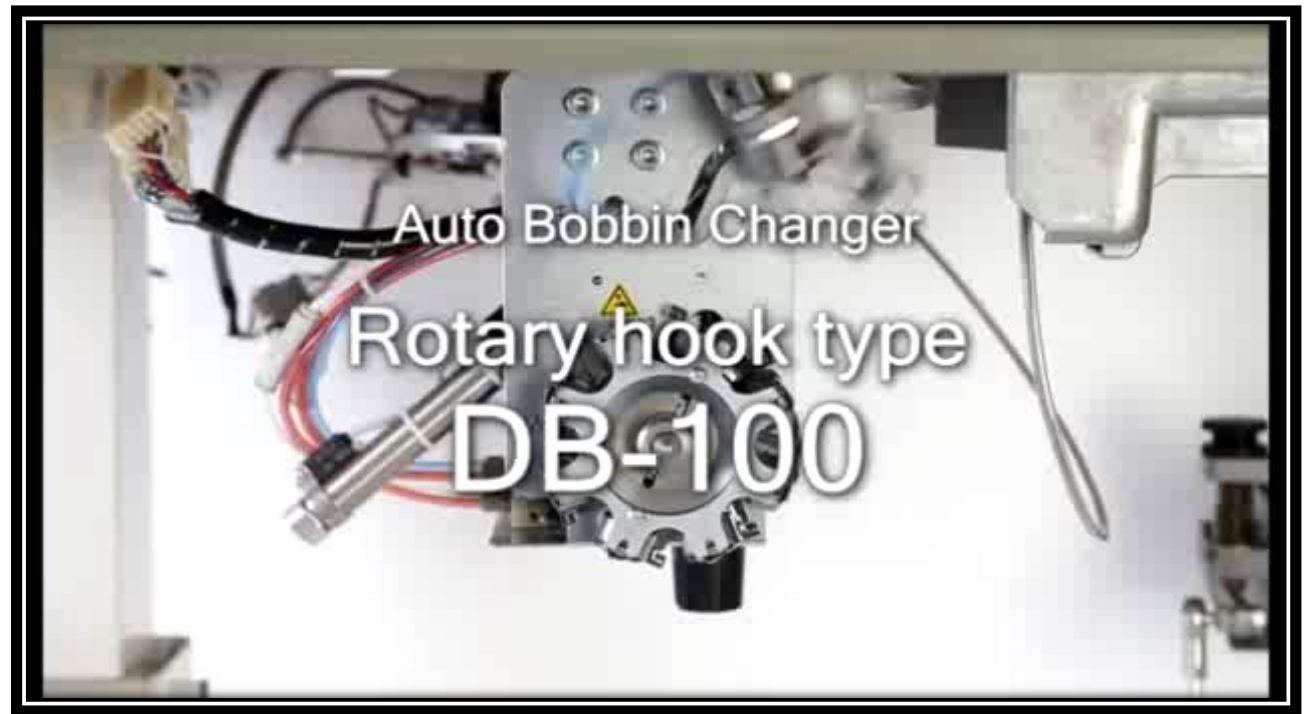




# HOT AIR TAPE SEALING



# **AUTOMATED** **Devices** **Used in** **Automation**



**Auto Bobbin  
Checker**



**Auto Skip Catcher**



**Auto Bobbin  
Changer**



# AFFORDABLE Robots



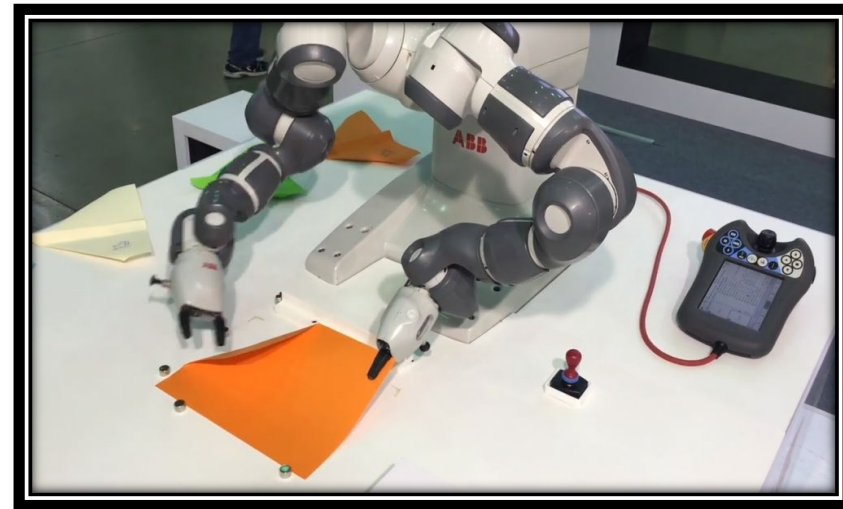
**Universal Dual Arm Robot**



**OMRON COBOT**

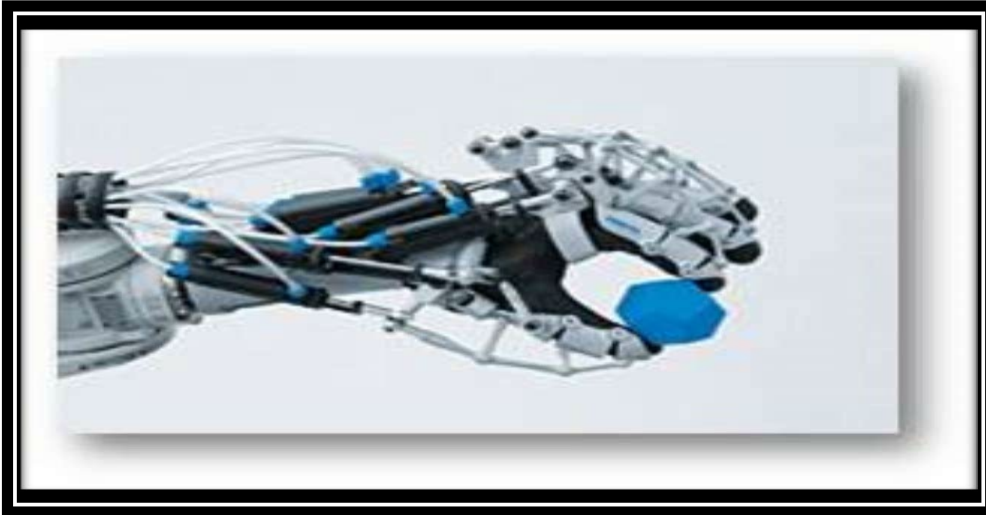


**FESTO BIONIC COBOT**

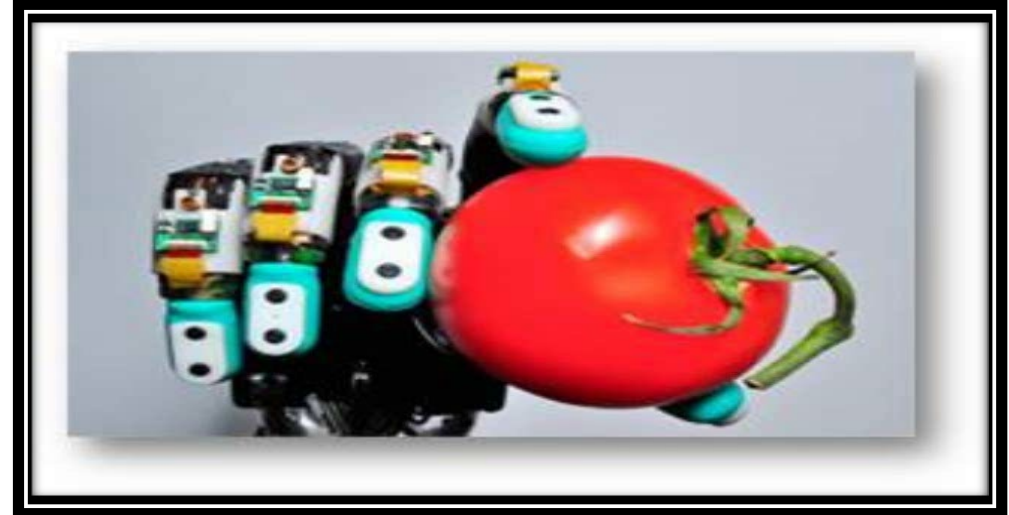


**ABB YUMI ROBOT**

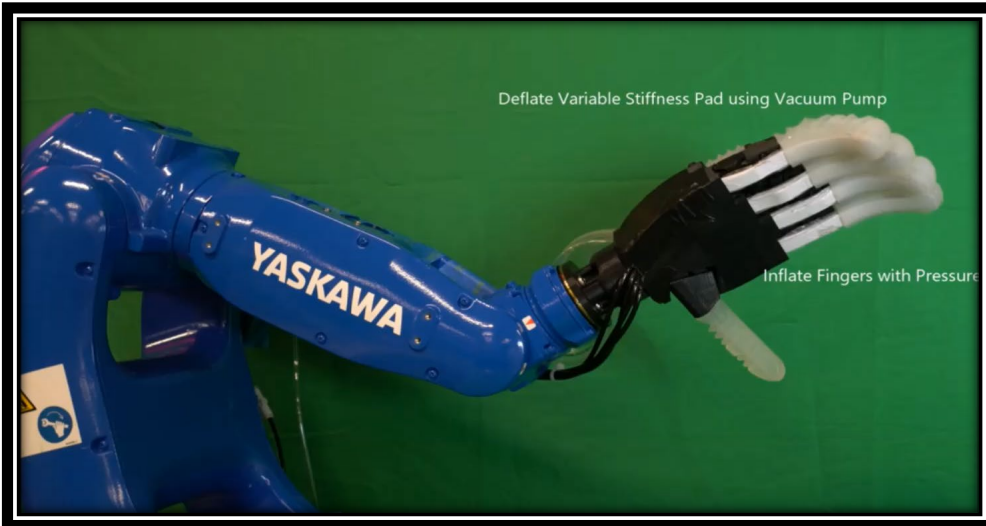
# End Effectors for Robots



ExoHand-Human Machine Interaction



SynTouch Texture Discriminating Robotic Finger



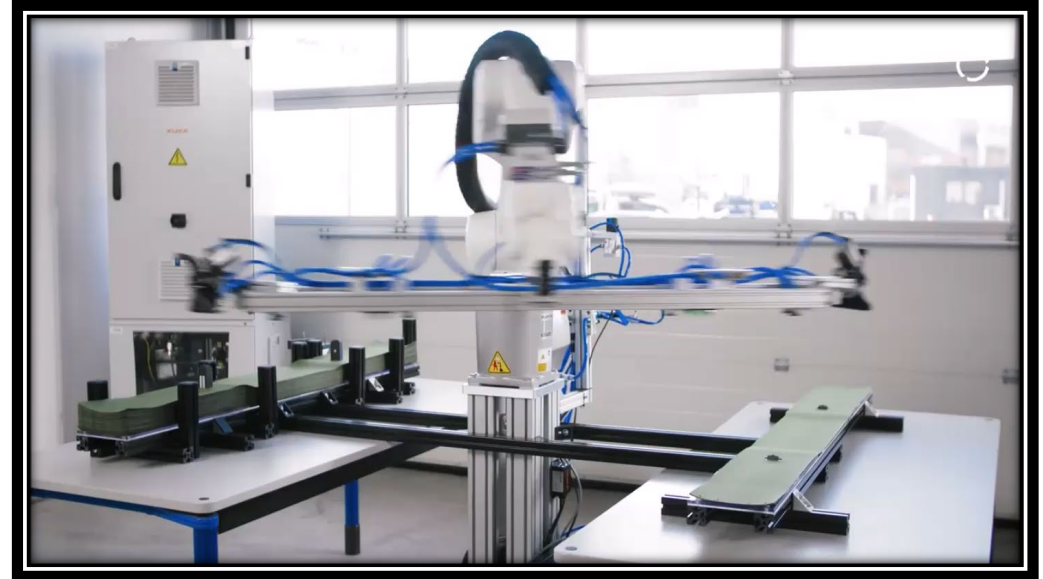
Pneumatic Actuated Soft Hand



Robotic Hand Tool Manipulation Task



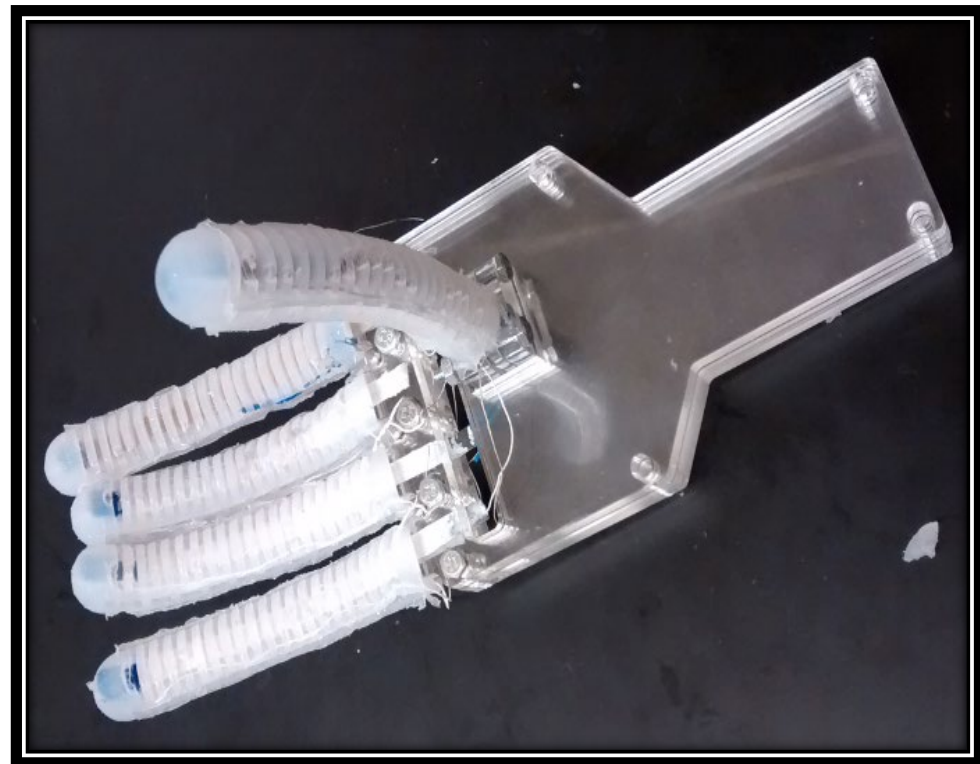
# Robotic End Effectors





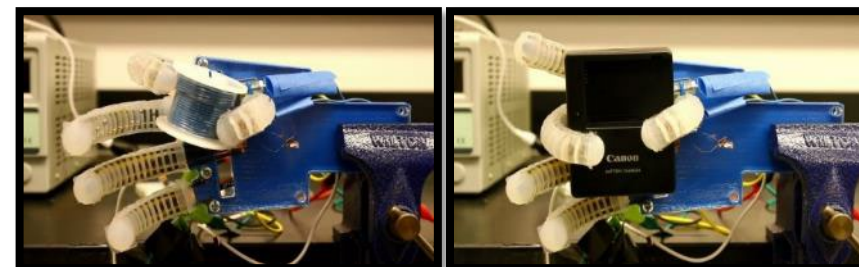
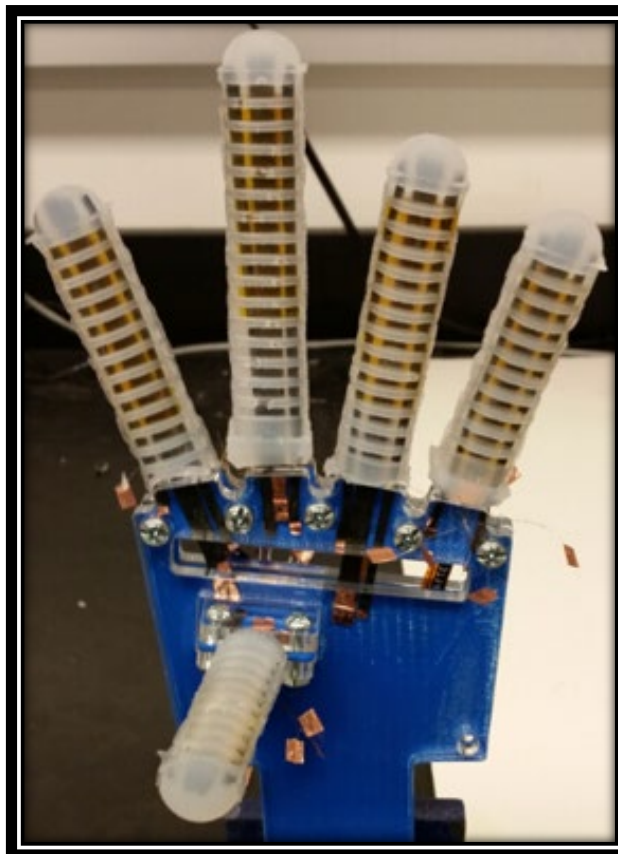
# Perdue University Soft Robotics

## CAMERA & HAPTIC TECHNOLOGY

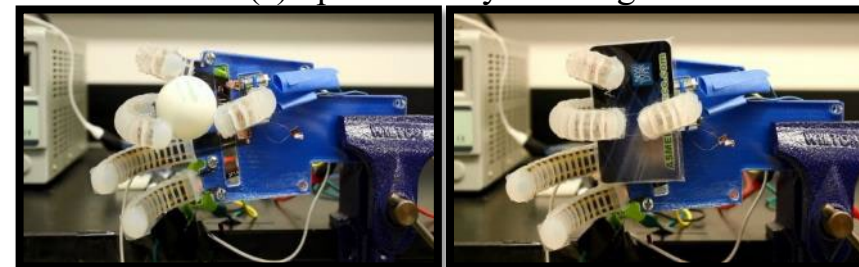


She, et al., *JMR*, 2015

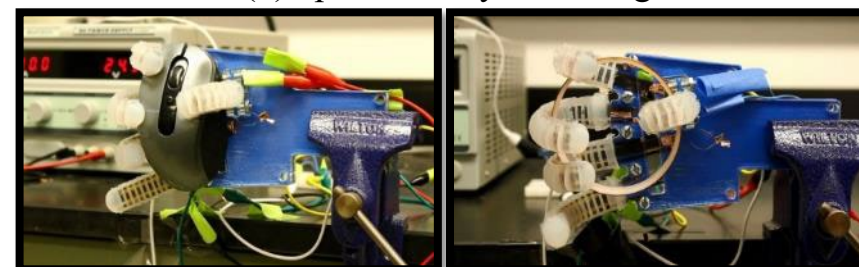
She, et al., *Soft Robotics*, 2016



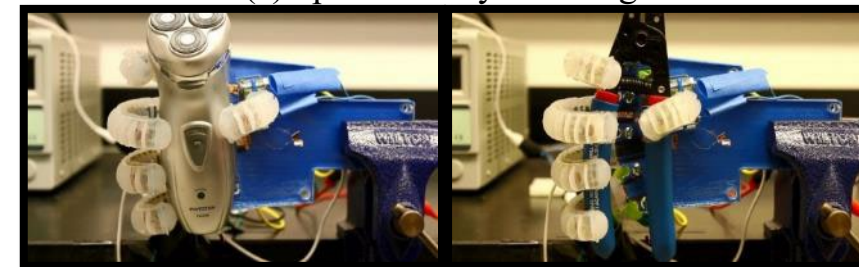
(a) operations by two fingers



(b) operations by three fingers



(c) operations by four fingers



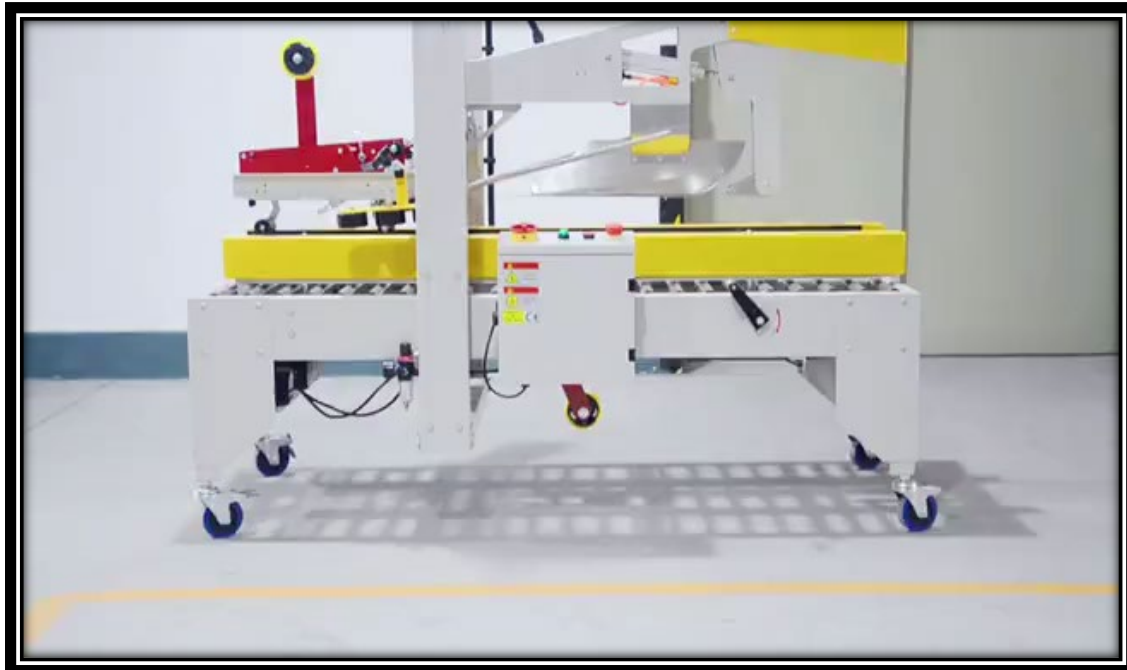
(d) operations by five fingers



# Automatic Folding Machine



# Box Erector and Tape Sealing

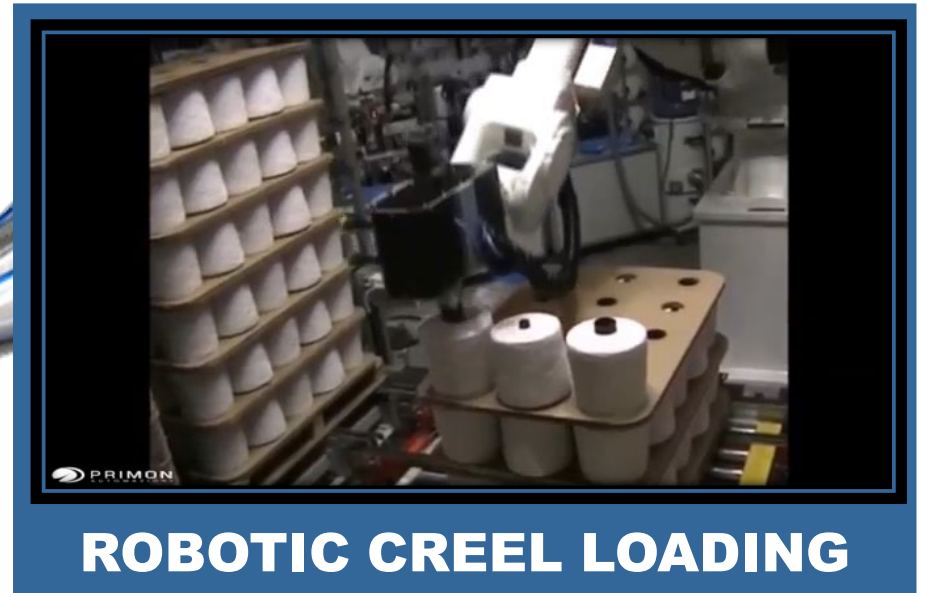




# WE Can Automate America *TODAY*



**ROBOTIC CREEL LOADING**



**ROBOTIC CREEL LOADING**

# THANK YOU!

## FOR YOUR ATTENTION

**Frank Henderson, CEO**

Henderson Sewing Machine Co., Inc  
1 Waits Drive Industrial Park  
Andalusia, Alabama 36420 USA

**Tel: 800-824-5113 / 334-222-2451**

Fax: 800-239-8398 / 334-222-4085

Cell: 334-488-4534

E-Mail: [frank@hendersonsewing.com](mailto:frank@hendersonsewing.com)



Advanced Textiles

**EXPO**



Advanced Textiles

# EXPO



ORGANIZED BY ATA

See You Next Year



Sept. 24-26, 2024

*Anaheim, California*

*See you next year!*

Advanced Textiles

EXPO

ORGANIZED BY ATA

Sept. 24–26, 2024 | Anaheim, CA USA

