Grip hand

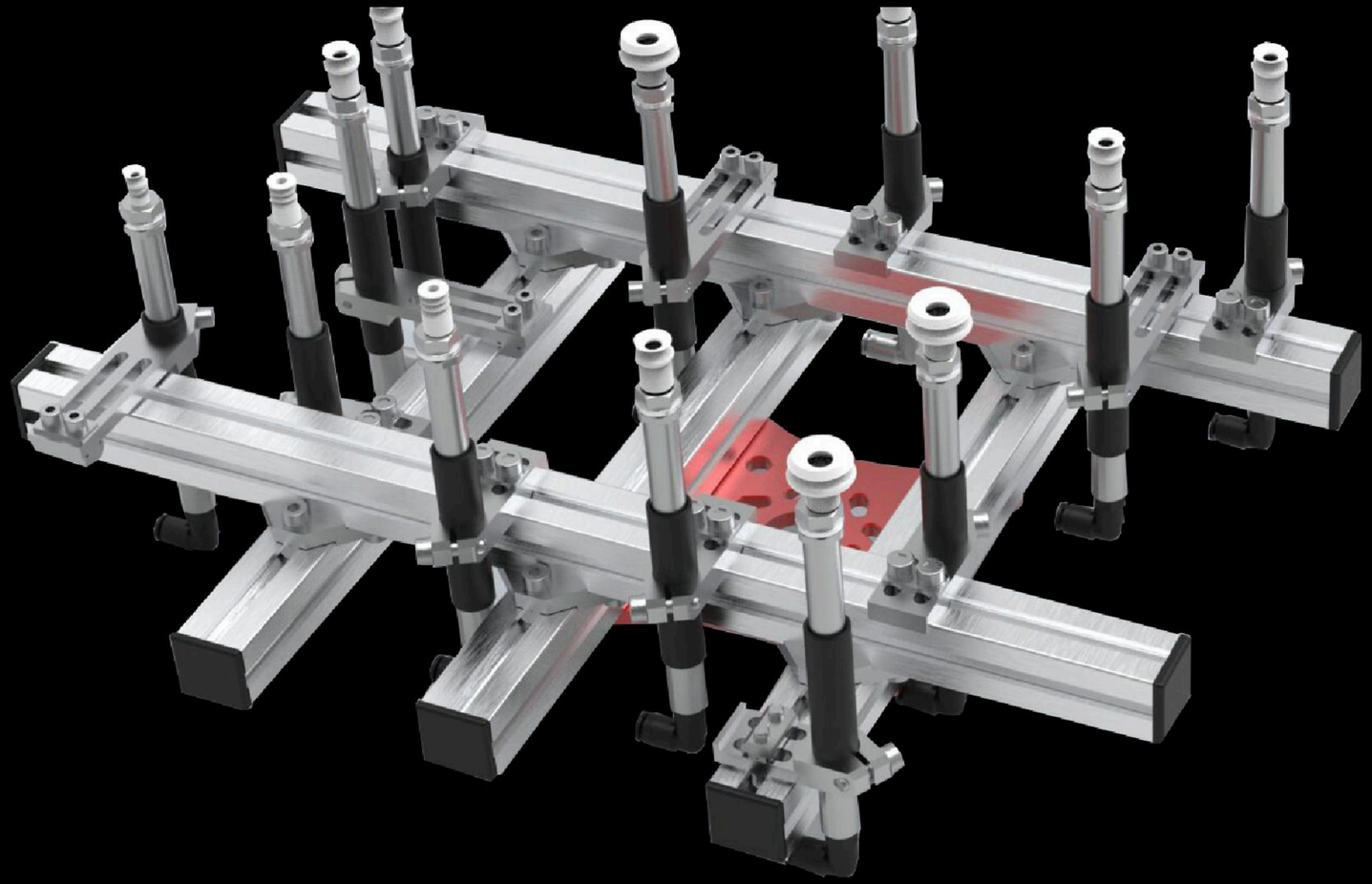
Presented by Daniele Marino

We have reinvented the grasping hand

we have devised, developed, and patented a grasping hand which is derived from the mold design of an item manufactured for injection molding of thermoplastic material; essentially, it is the negative shape of the item itself.

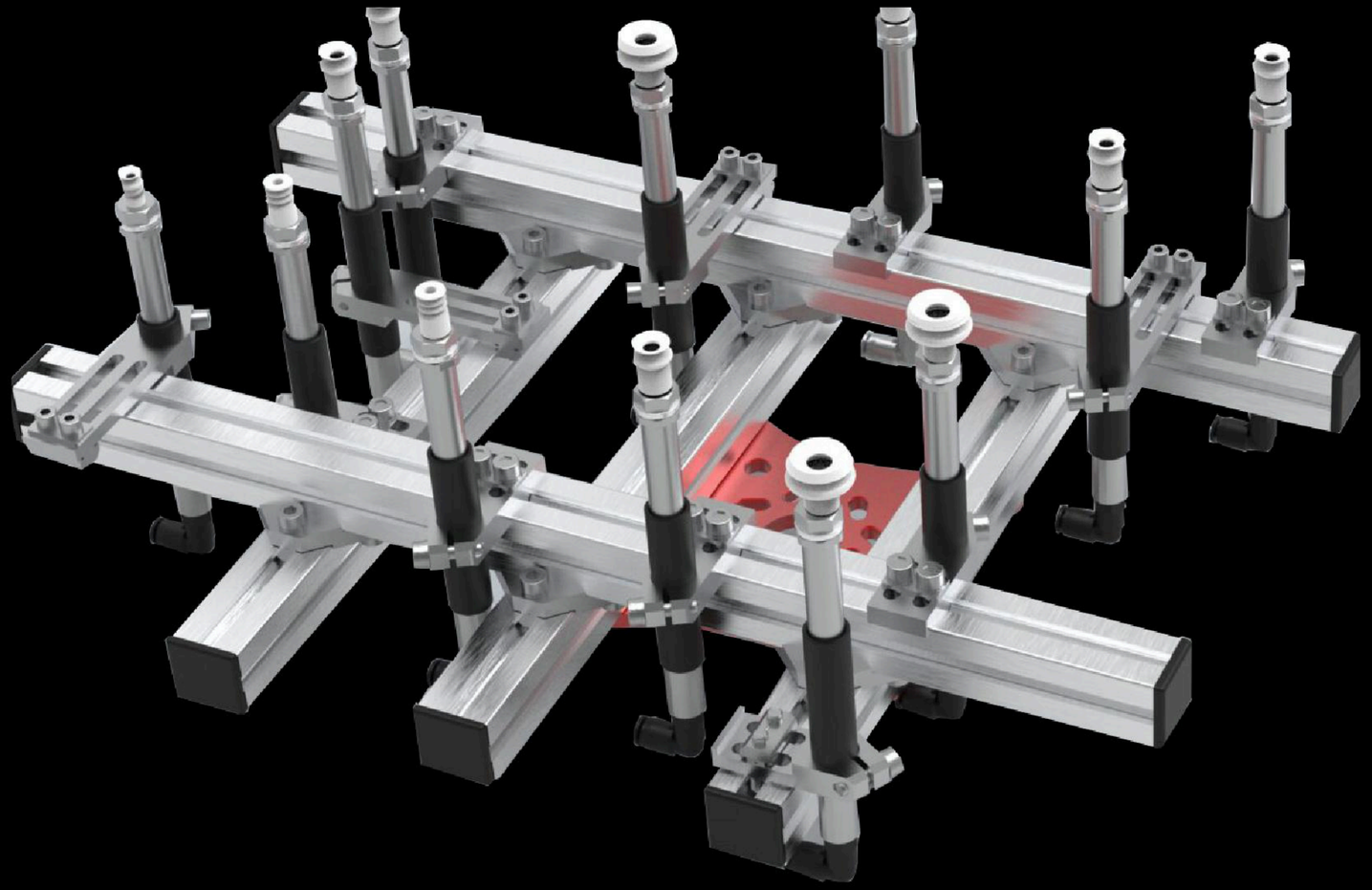
This image is not the grasping hand patended; it is a photo used as a graphical support for this presentation.

Challenges to Address



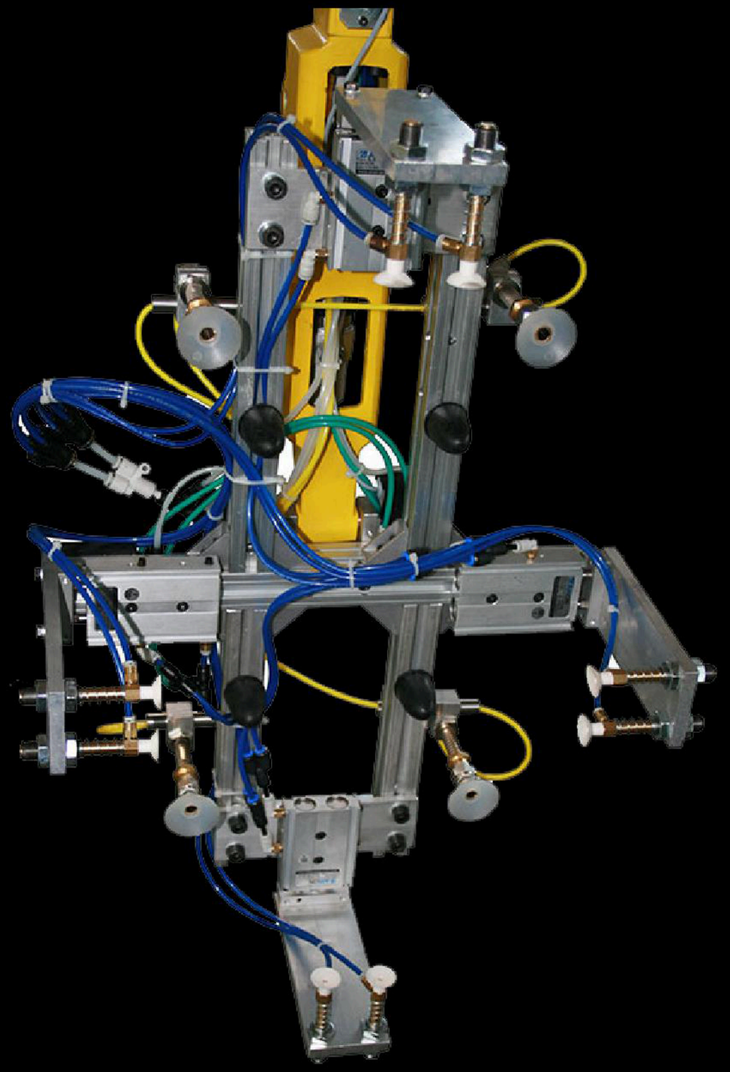
1. Precision in extraction during the injection press phase to avoid damage to the molded part.
2. Reducing the injection press cycle time without altering the plastic parameters.
3. Reduction of robot setup times.
4. Reducing operator time for quality checks or handling of molded parts.
5. Reducing the weight of traditional grippers to avoid overburdening the robot arm.
6. Reduction of costs and cycle times for equipment required after extraction, such as for cutting the same material.

State of the art

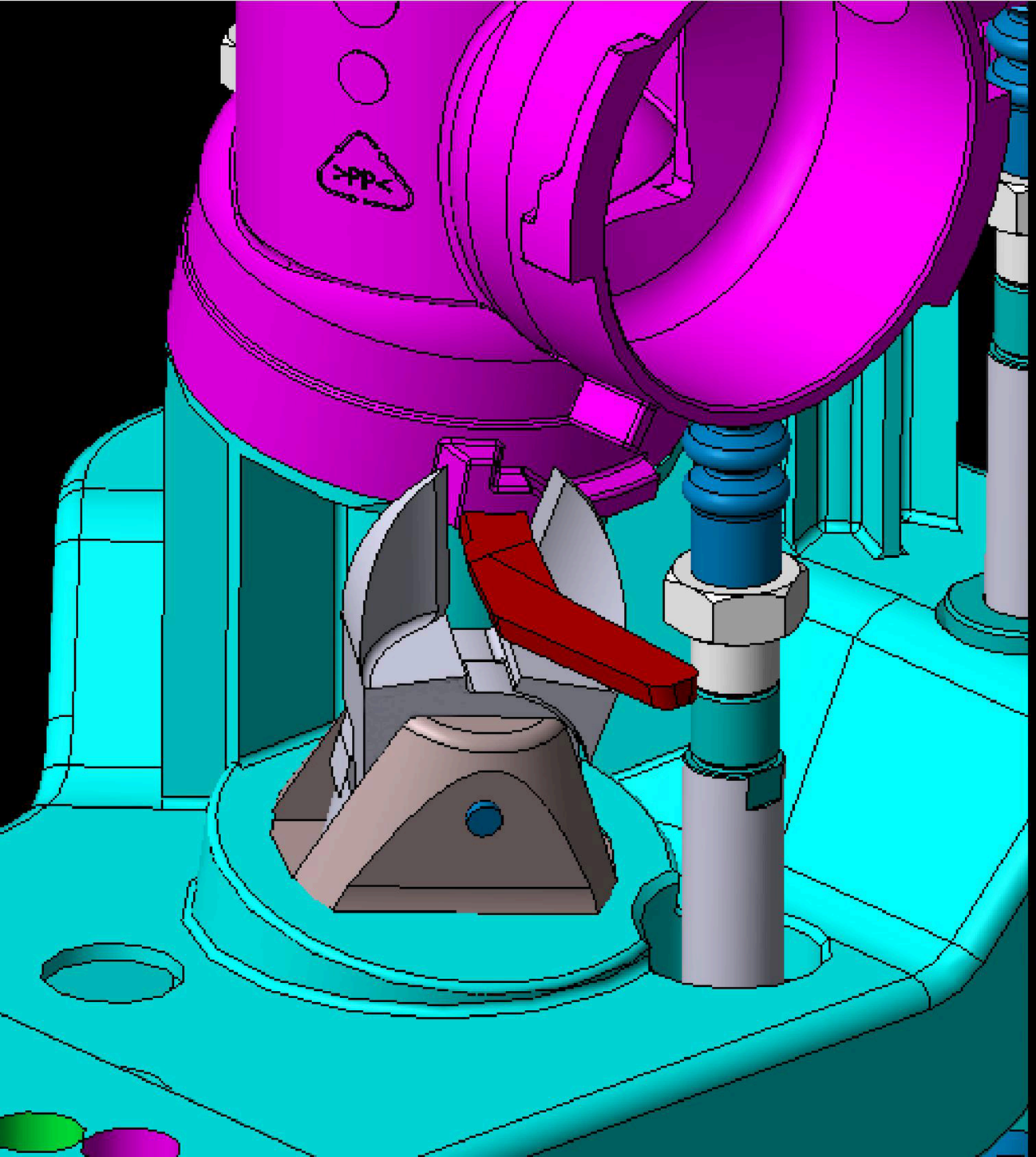


The state of the art in end-of-arm tooling exhibits an exacerbation of critical issues, particularly in processes requiring multiple mold changes, where installation and setup times become crucial. The approximate precision of gripper actuator positioning tends to generate anomalies and cycle stops.

They say ...



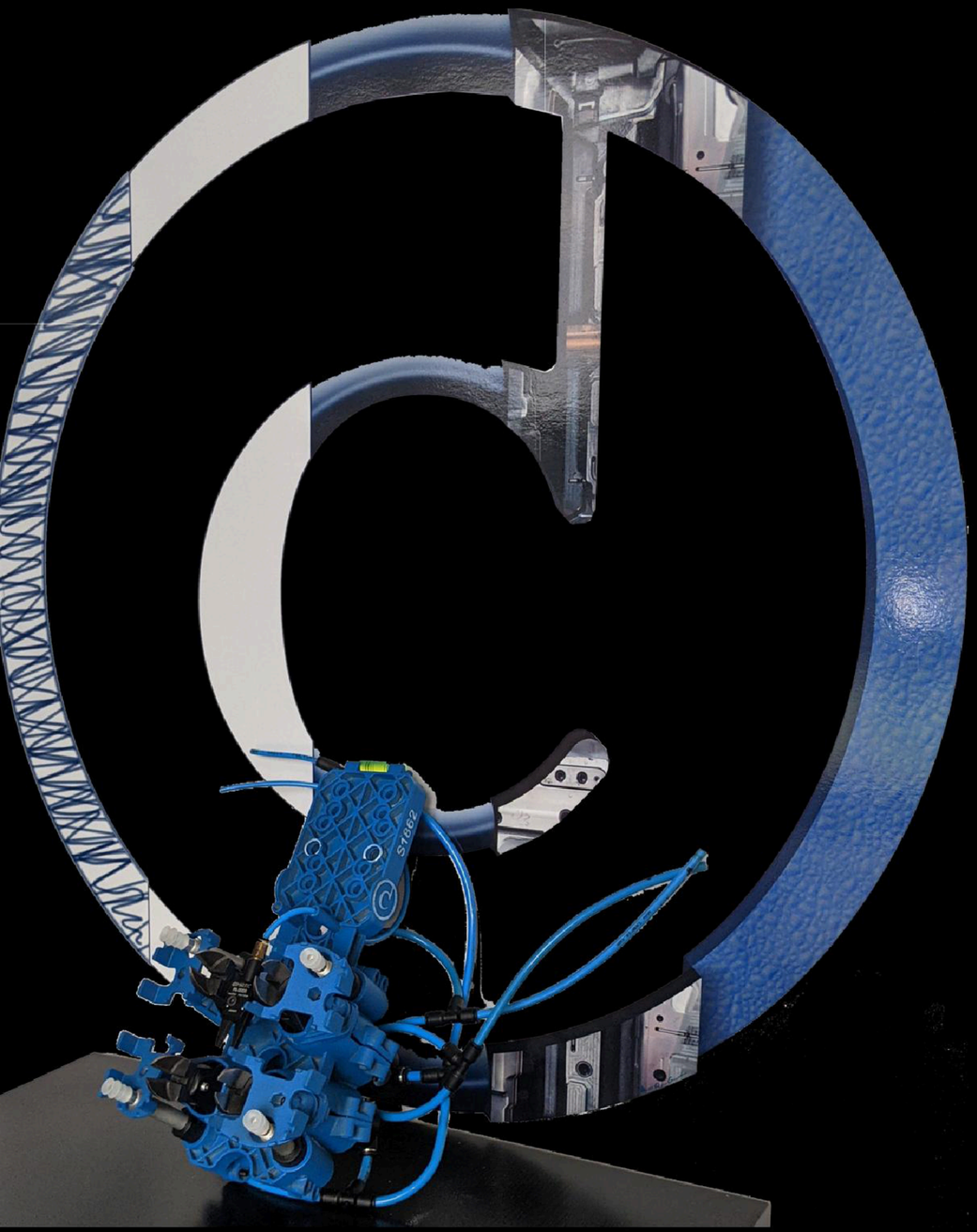
The toolmakers and technologists argue that standardized commercial construction elements for making grippers (such as aluminum profiles or steel rods assembled in a configuration suitable for the type of manipulator and the type of item to be gripped) ensure excellent adaptive flexibility. This claim is supported by their experience and certainly does not align with the need to reduce setup downtime, especially for more complex shapes of the molded item.



Realization

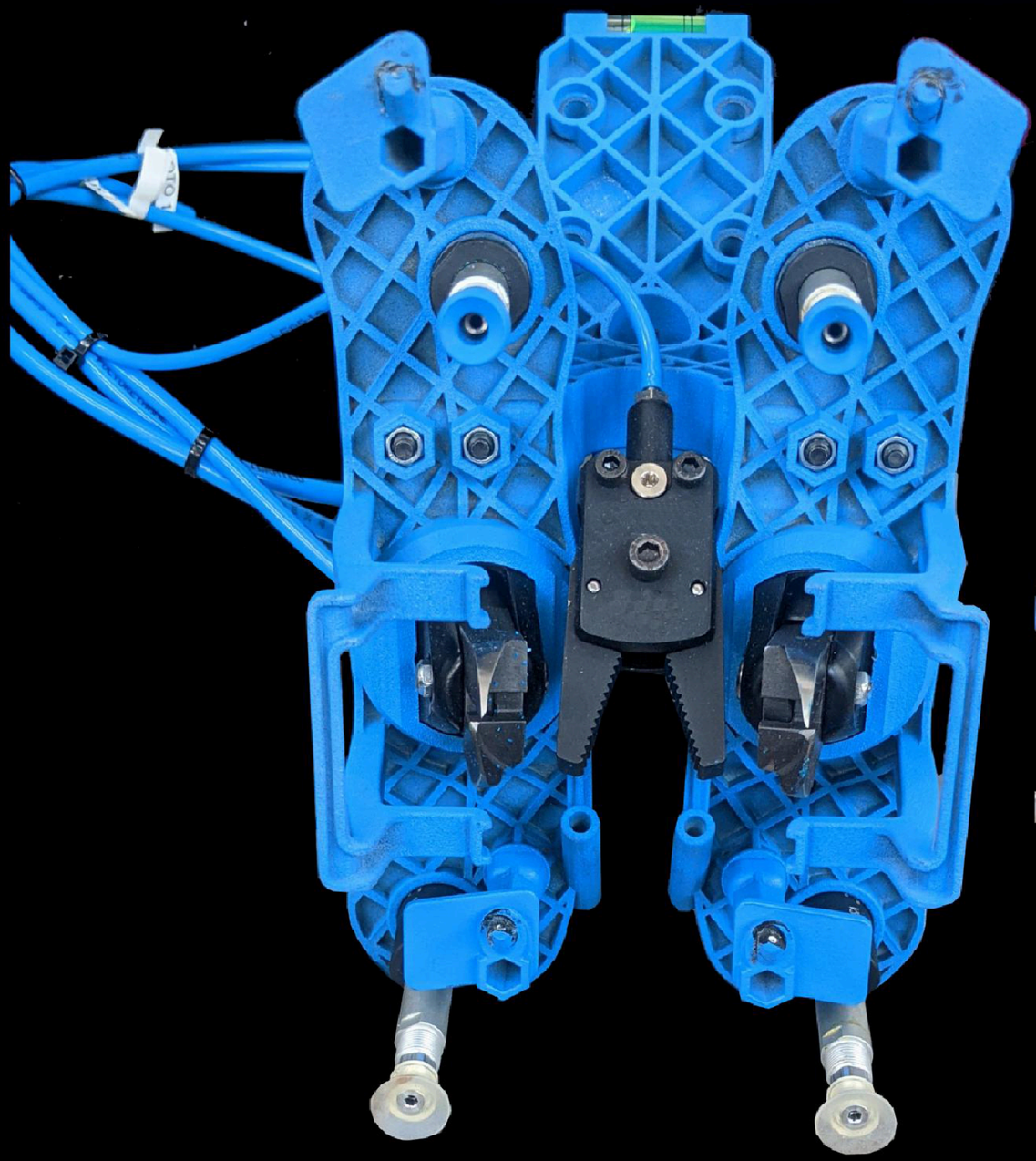
The grippers (patent IT, patent pending EU) are designed using CAD on the 3D model of the mold they refer to, allowing for a comprehensive view of the mold's kinematics, including the extraction of the part and the operation of the gripper. This provides a real-time visualization of the process.

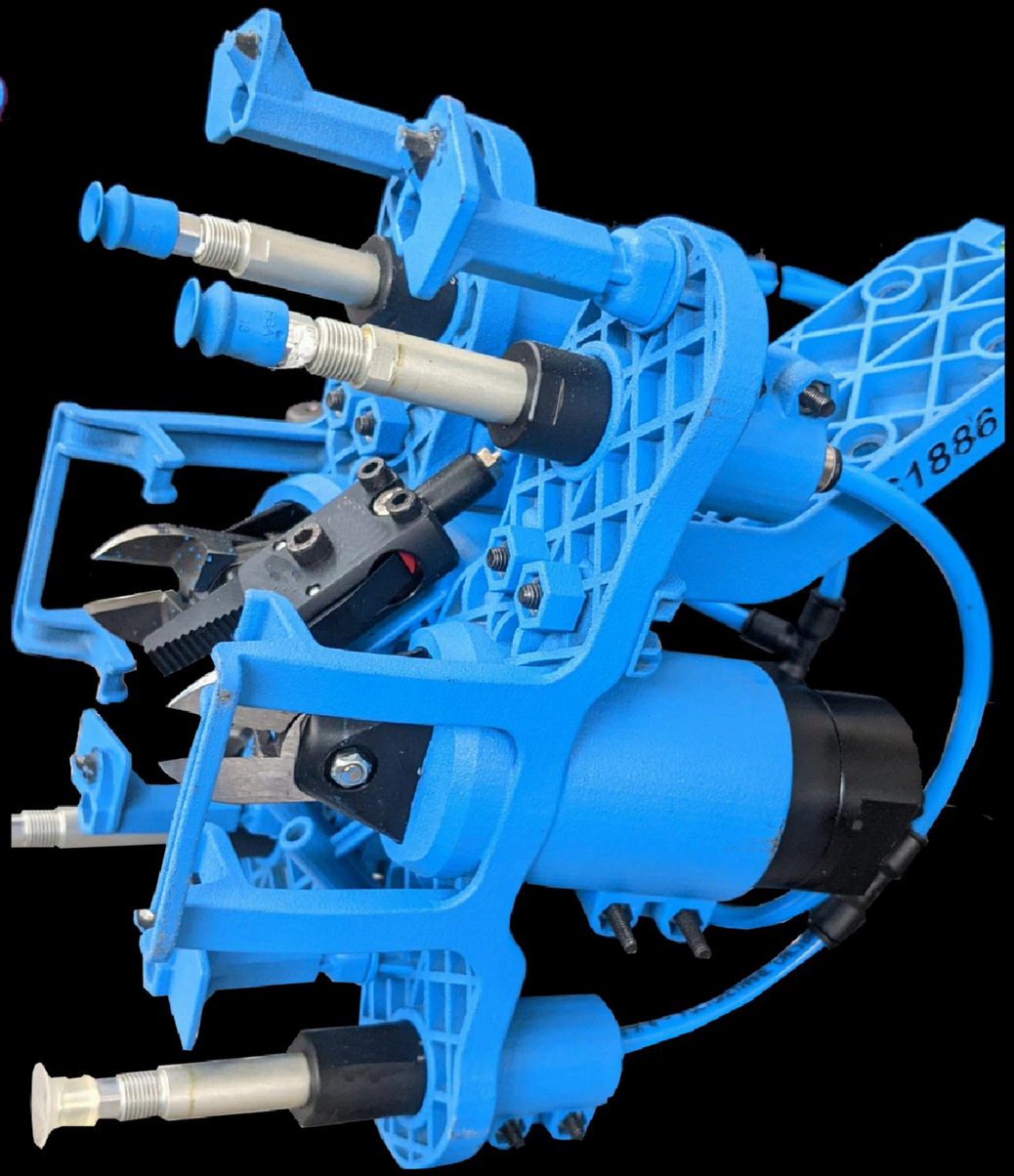
Strengths



- Accurate retrieval of the part for extraction from the press.
- Reduced waste due to instability and imprecision of the gripper compared to traditional systems.
- Greater speed of robot arm extraction from the press confines, resulting in reduced molding cycle times.
- Simultaneity and precision of trimming the material and other quality checks during downtime for hovering and deposit.
- Significantly reduced gripper setup times, benefiting press costs.
- Fast and easy replication in case of breakage without any control or tuning on the machine. Each replica is identical to the design.
- Reduced and almost eliminated machine stops caused by approximate extraction.
- Operator and toolmaker times optimized.
- Utilization of robots with payload not oversized for the weight of the end effector.

Some examples





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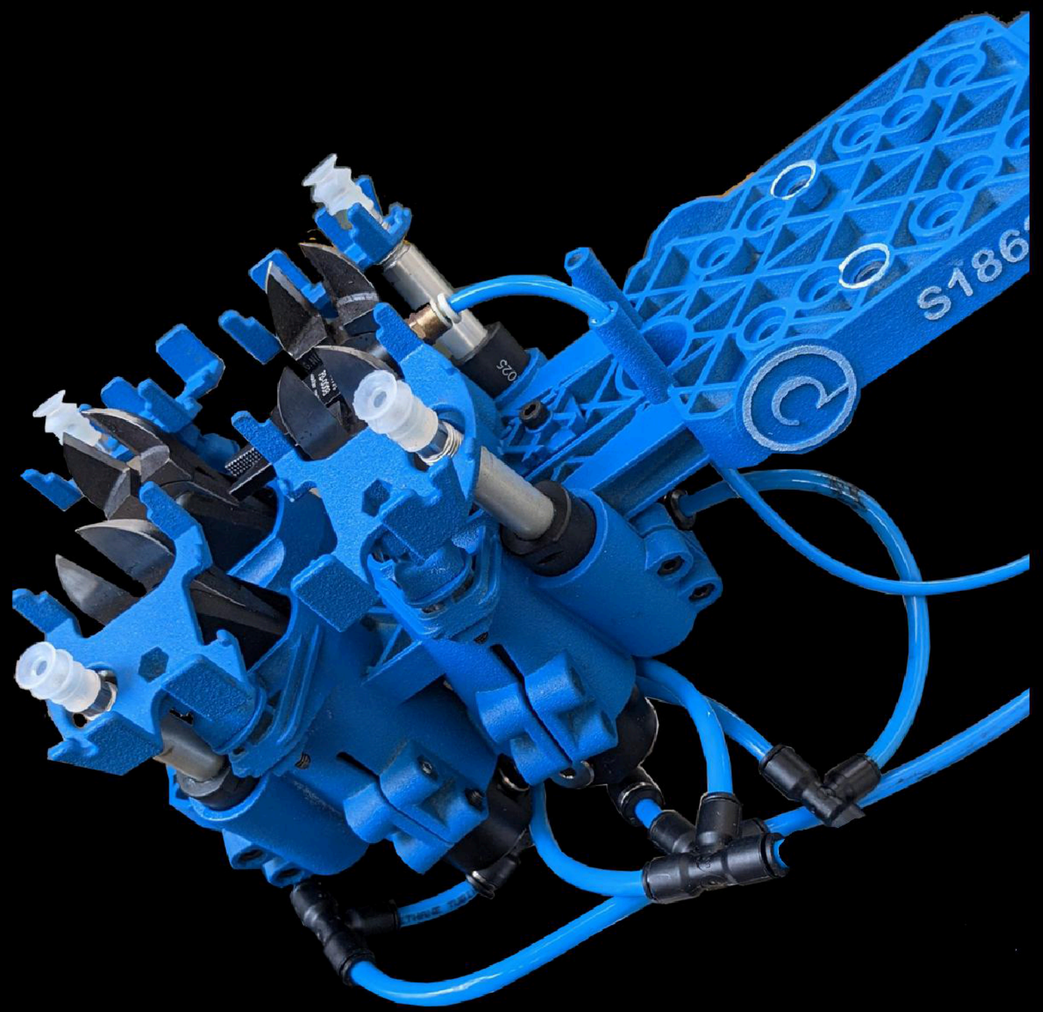

Some examples