



Pronto Pizza Pie

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Objectives

The common restaurant business model is unsustainable.

- Understaffed restaurants due to increased labor costs
- Substandard products being used due to spiking food costs.

Motivation

Introduce automation to the service industry to streamline labor costs and provide consistent products to consumers.

Experimental Results

- The current and common restaurant business model is unsustainable.
- Understaffed restaurants due to increased labor costs (wages)
- Substandard products being used due to spiking food costs.

System Design

Conveyor System

- Moves pizza (flattened dough) through topping stations
- Spins pizza to evenly place toppings

Stations

1. Sauce Station
 - Syringe pump system
 - Variable flow capable
2. Cheese Station
 - Shred Cheese on demand for freshness
 - Slider Crank Mechanism design
3. Toppings Station
 - Screw conveyor scalable for various toppings
 - Variable flow rate capable
 - Compact design to ensure ingredient variety

Electrical & Control System

- Velocio programmable logic controller (PLC)
- HMI – Human Machine Interface
- Stepper Motor Drivers
- Constant Surface Velocity Mathematical Control Models (differential equations)

Conveyor System

Based on a 3D printer system

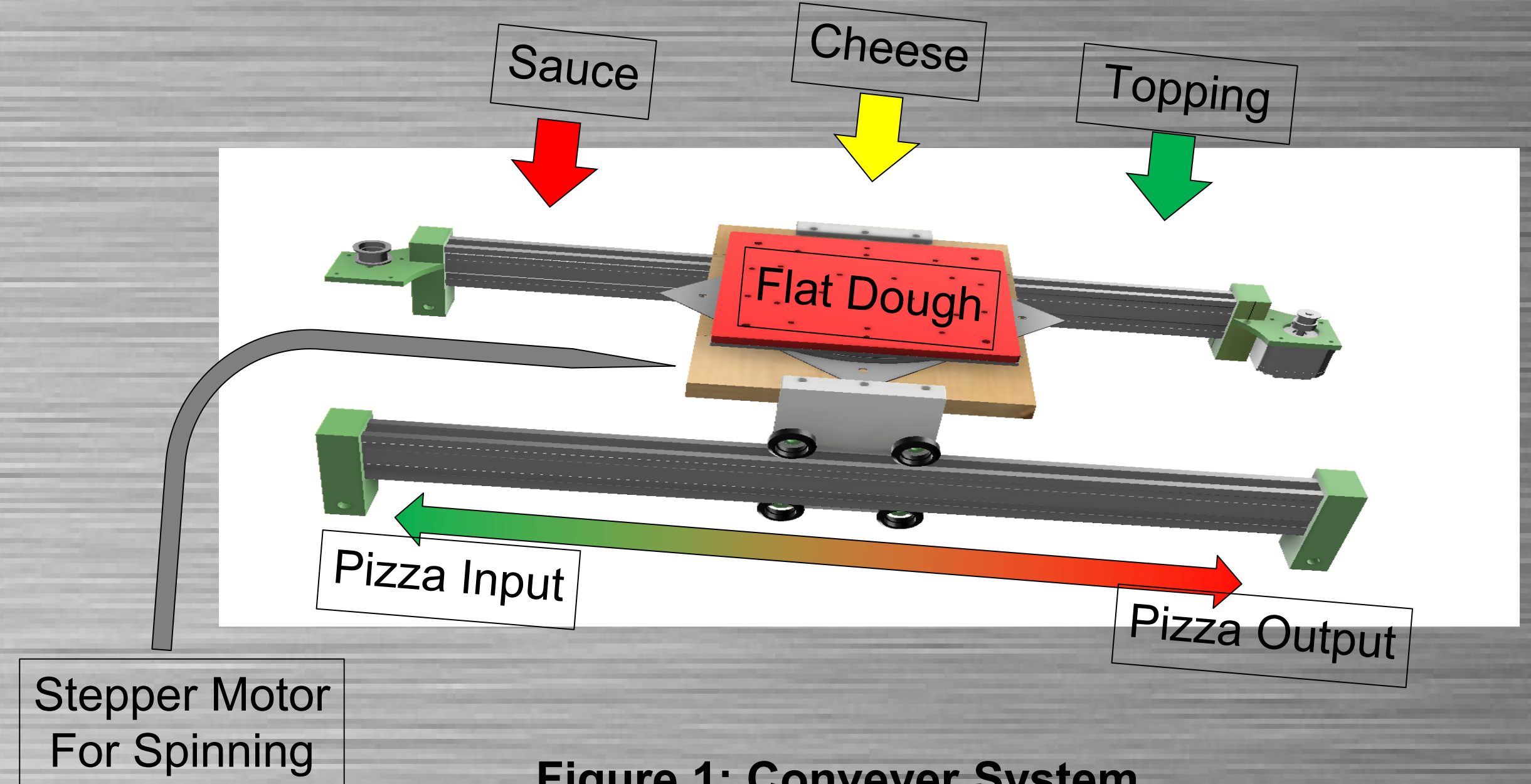


Figure 1: Conveyor System

Cheese Shredder

Slider Crank Mechanism Design

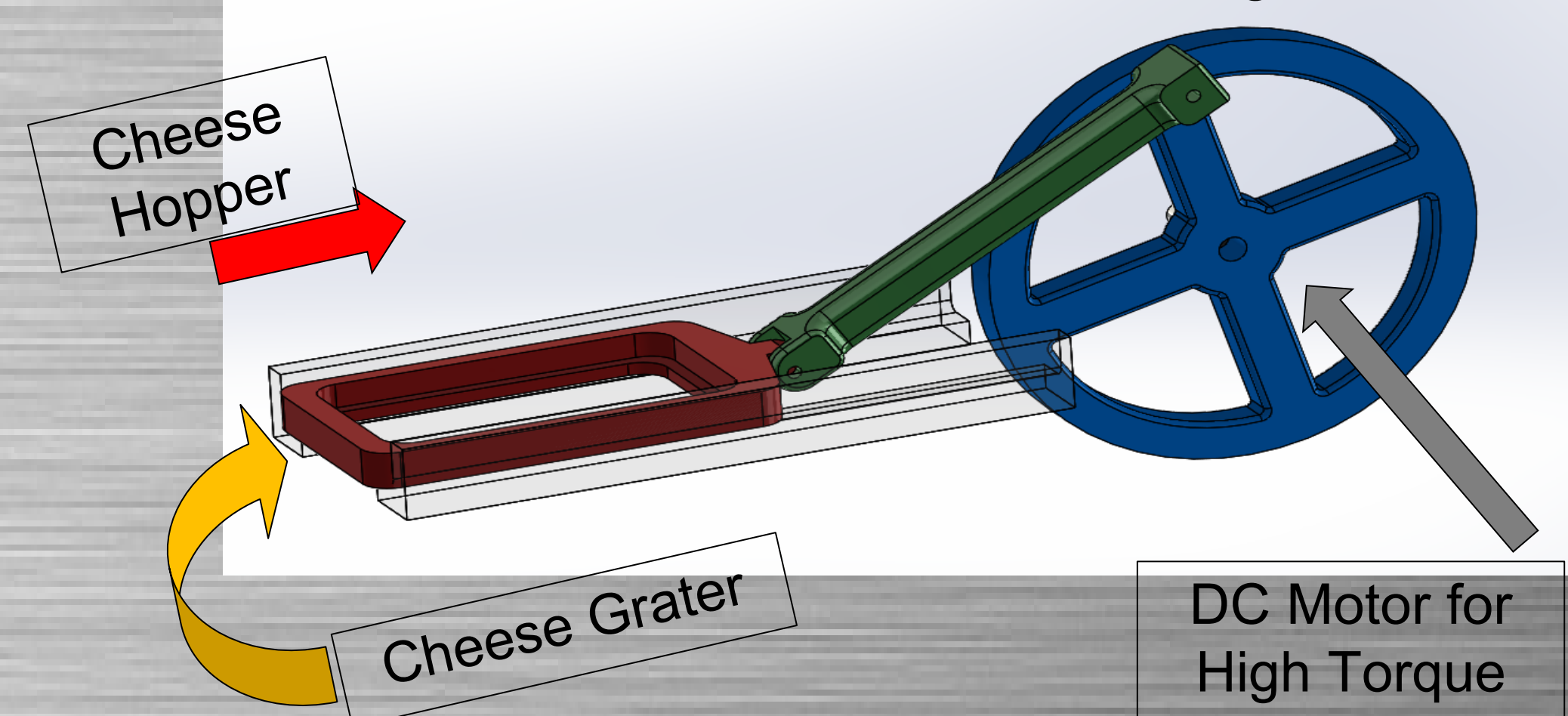


Figure 2: Slider Crank Mechanism (Cheese Shredder)

Sauce Pump

Syringe Pump Design

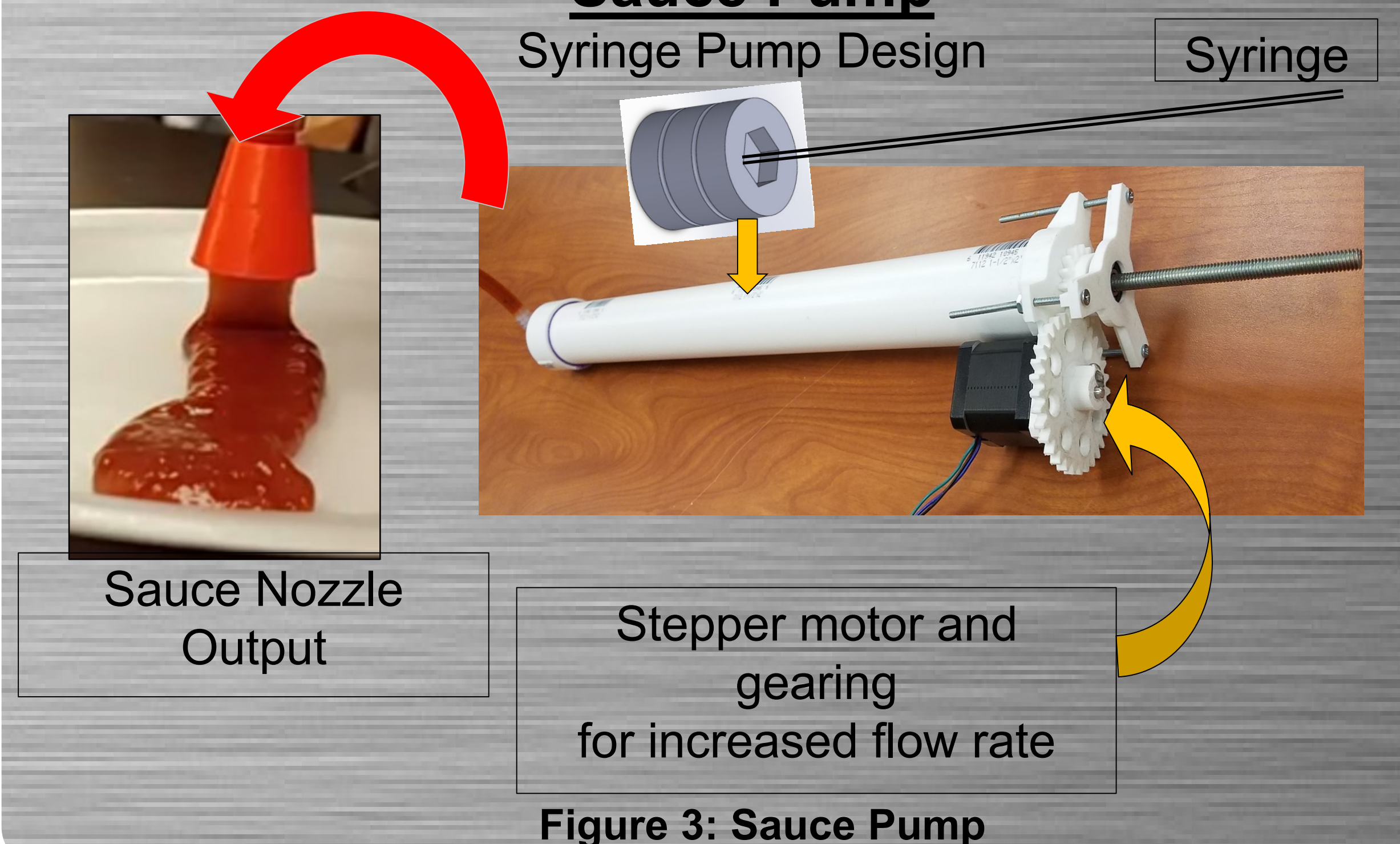


Figure 3: Sauce Pump

Topping Dispenser

Screw Conveyor Design

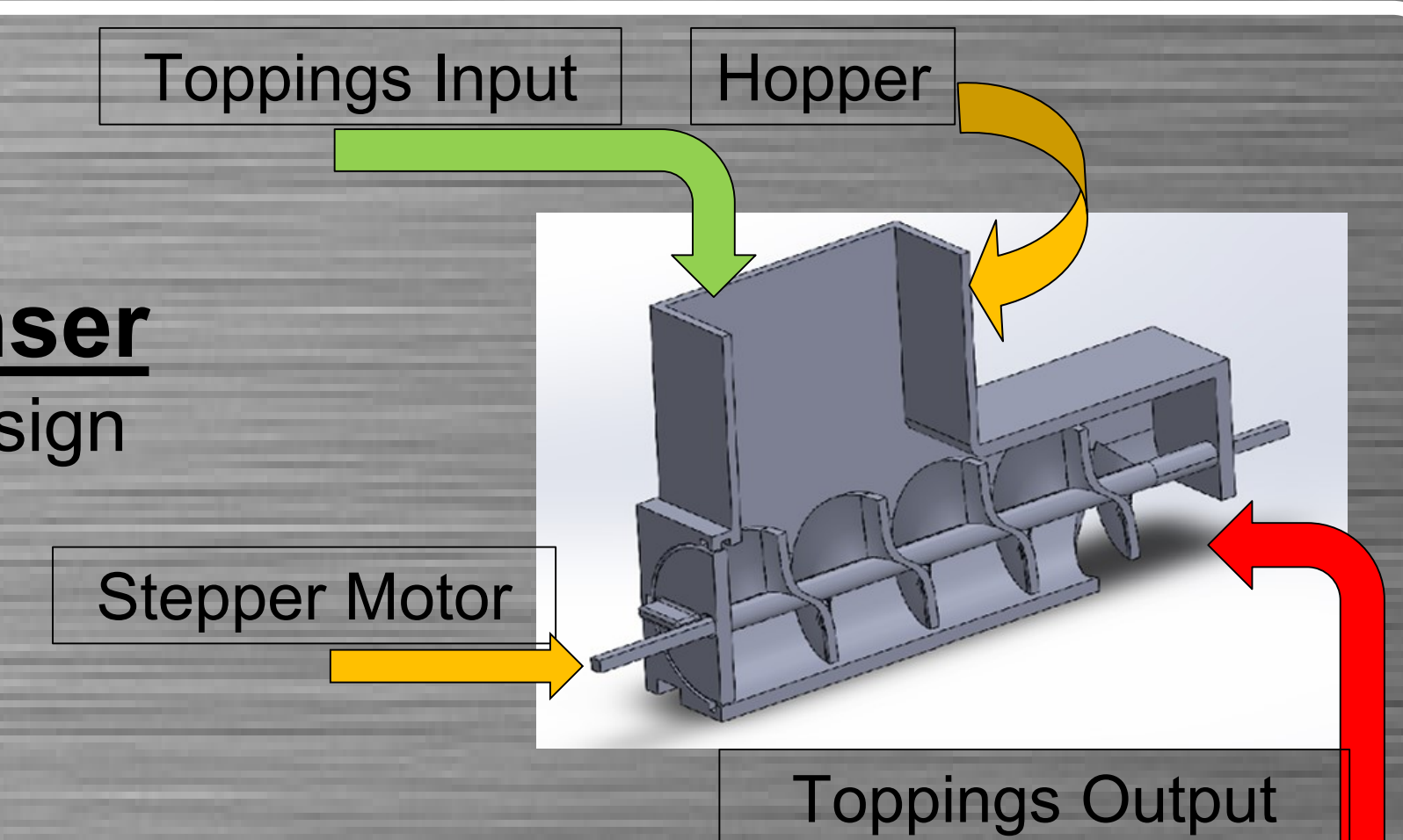


Figure 4: Screw Conveyor (Toppings)