

“Happy Egg” Washer

Blue B

Customer Need

Target Customer

- Pete and Jen's Backyard Birds
 - Small farms cannot afford expensive egg washers
 - 80,000 egg farms (<50 acres) could potentially benefit

Design Goals

- Automated machine to **clean dirty eggs**
- Cleans **faster** than a human alone
- Allows for **portability**
- Keeps eggs **organic** and **safe**

Product Contract

Product Description: Portable egg washer with automated washing/drying cycles

Intended Customer: A farmer who hand washes eggs

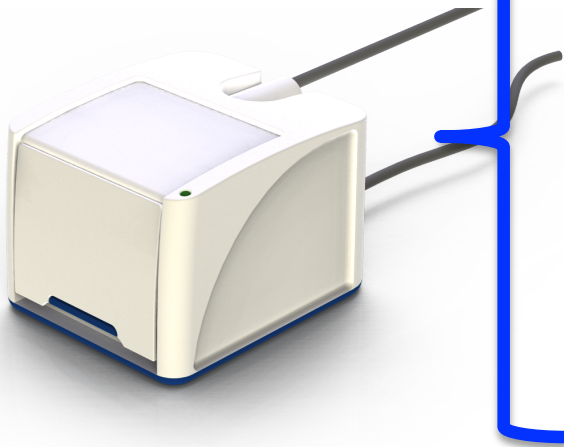
Potential Market: Small-medium scale chicken farms

Customer Need	Attribute	Unit	Engineering Specification
Fits on counter-top	Dimensions Size	ft	< 3
Portable	Weight	lbs	< 100
Washes eggs faster than human alone	Cycle Time	min.	< 8
Flexibility in egg load size	Batch Size	eggs	2-5 dozen
Adaptability	Connects to faucet/power outlet	Binary	Yes
Needs eggs to be dried for packaging	Dries eggs within cycle time	Binary	Yes
Cleans eggs	Removes dirt/feathers/blood/yolk off the surface of eggs	Binary	Yes

Identified Risks

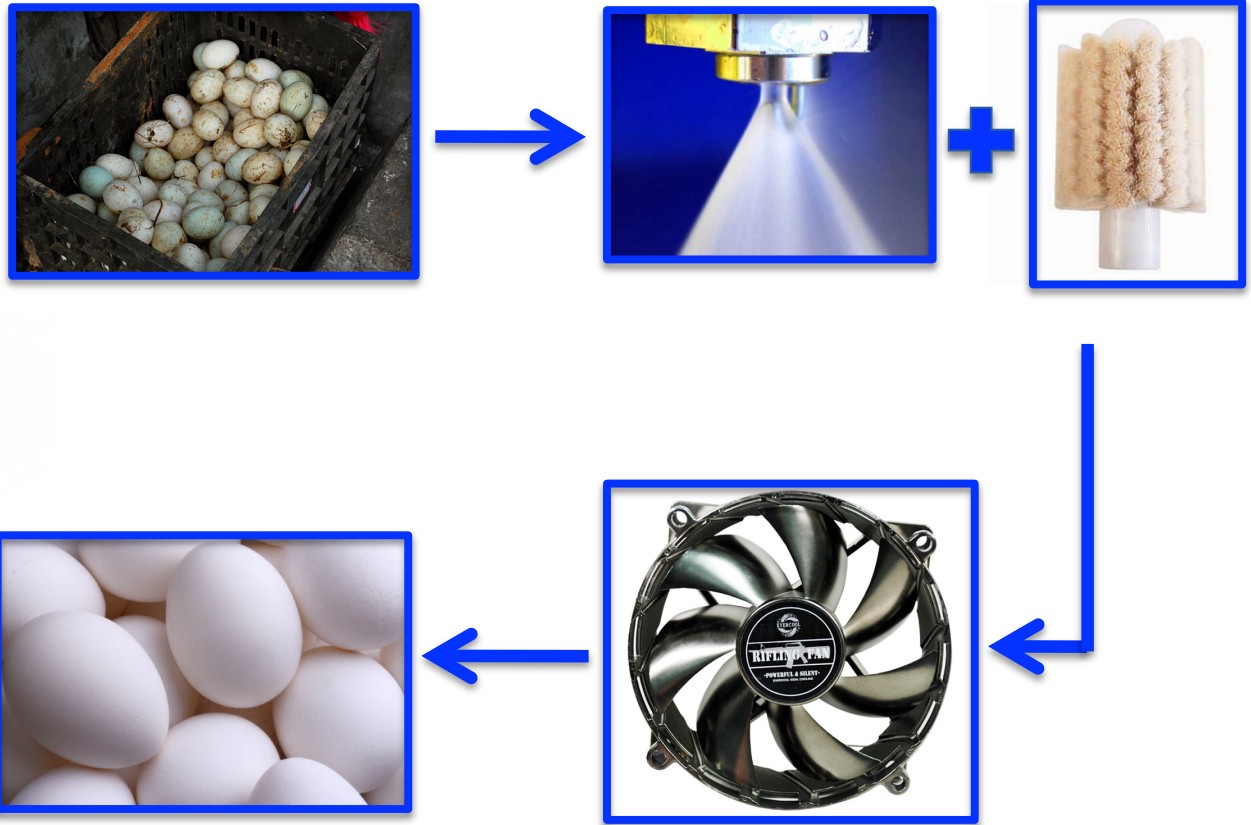
Risk #1:

Machine size is not suitable for counter-top/portability



Risk #2:

Does not clean dirty eggs thoroughly and quickly

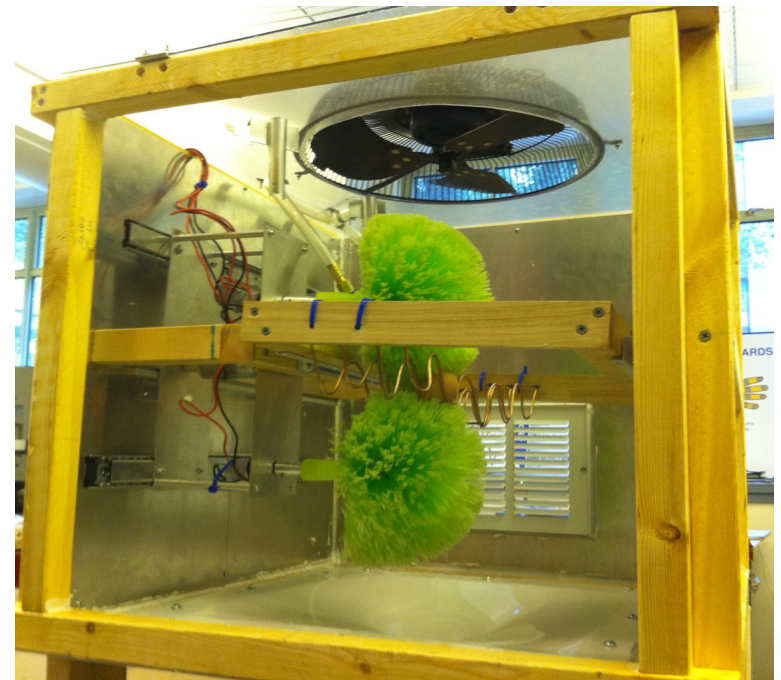


Risk #3:

Does not follow local health regulations (eggs not soaking in water)

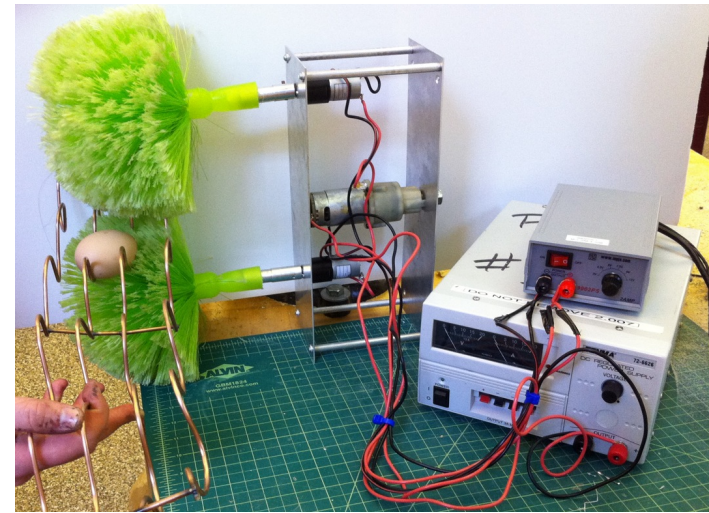
Washer Size

- Size is limited by:
 - Tray dimensions
 - Placement of motor box
- Final design will allow for:
 - Optimal batch size of 40 eggs
 - Dimensions: 17" x 17" x 26"

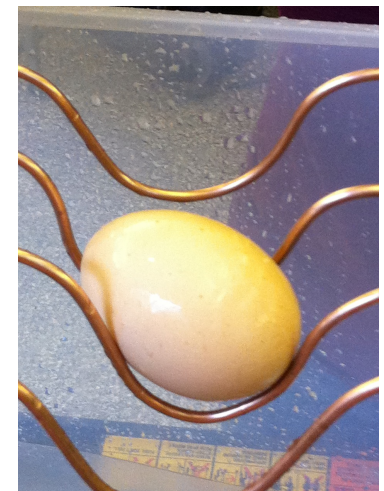


Washing + Brush System

- Two circular brushes
- Two 3V DC motors for spinning of brushes
- One 12V DC motor for linear actuation of brushes
- Cleans a single egg in ~30 seconds



Before



After



Drying System

- Eggs must be dried before packaging
- Testing shows that two fans will be required
- Current setup:
 - Top half dries in 25.4 seconds
 - Bottom half dries in 74 seconds



Summary of Findings

- Device must be smaller for counter top use
- Combination of two rotating brushes successfully cleans dirty eggs
- Drying system only dries the top of eggs
- Future design will include cylindrical brushes that sweep an entire tray of forty eggs



Acknowledgements

- Dr. Barbara Hughey
- Pete and Jen's Backyard Birds
- Lab Instructor: David Meeker
- Jeffrey Senez