
Lift-n-Lock

Mock-Up Presentations
October 2010
Purple A

A



lift-n-lock

Concept

Lift-n-Lock is an assisted-lift oven rack which facilitates bringing a dish from the oven to the countertop.

Targets independently-living wheelchair users.



From oven to counter.

A




lift-n-lock

Motivation

Lifting food from the side of the oven is unsafe and compromises strength.



Product Contract

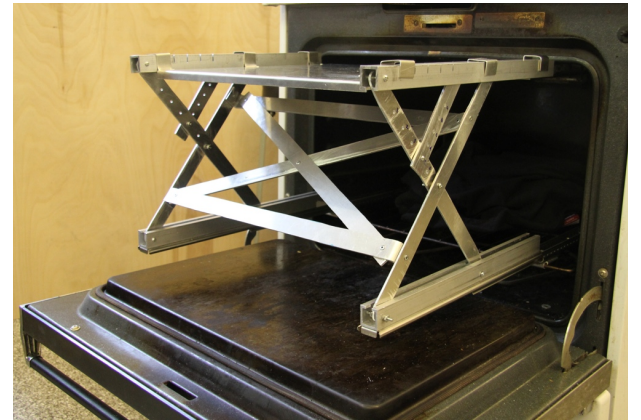
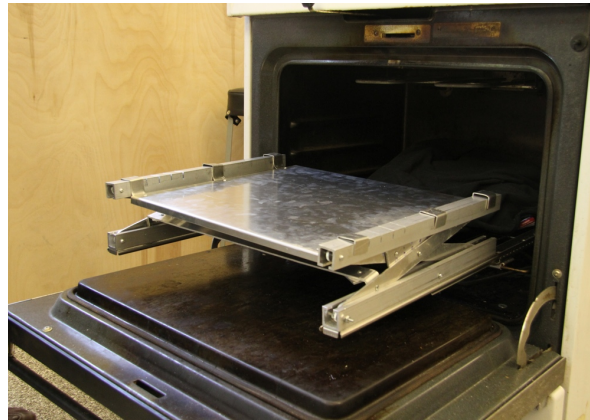
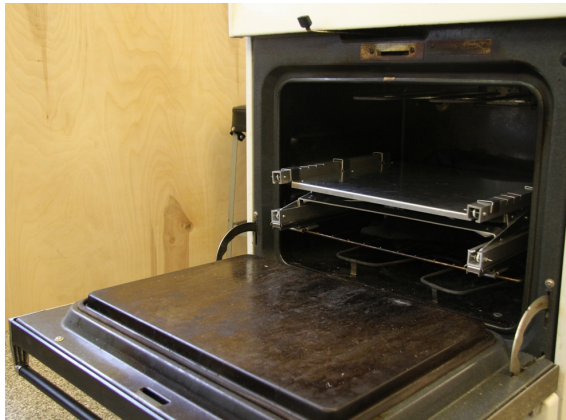
Customer Needs	Product Attribute	Engineering Specs
Can be easily lifted.	Mechanical Advantage Ratio	At least 1:4
Fits into existing ovens.	Size	Height: 17" +/- 1.5" Width: 23.9" +/- 1.7" Depth: 18.7" +/- 1.1"
Accommodates different food sizes.	Height Adjustability	Yes
Accommodates different food weights.	Weight Capacity	2 lb tray of cookies to 30 lb turkey
Allows for gentle and stable transfer of food.	Vibration	No  lift-n-lock

Spring/Scissors

Features

Springs store energy to provide an assisted lift.

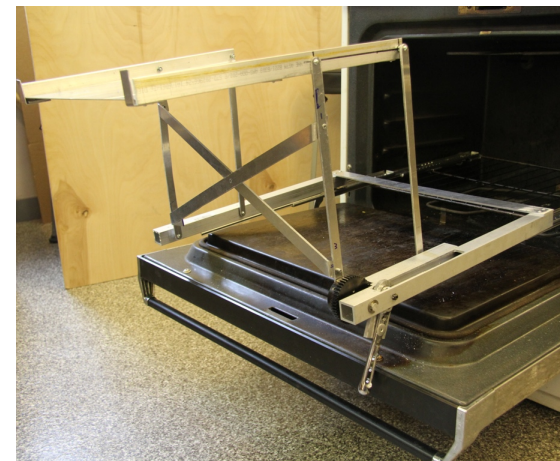
Two equilibrium points at the top and bottom.



Ratchet/Lever

Mechanical advantage: $F_{applied} = \frac{F_{weight}}{Ratio_{gear}} \frac{Length_{linkage}}{Length_{lever}}$

Easy and controllable lifting motion.



Conclusions

The vertical motion of the rack translates into a more complicated internal mechanism than expected.

Creating a simple user interface was a challenge.

Space constraints are difficult to accommodate.



lift-n-lock

Next Steps

Retrofit to existing ovens.

Refine locking mechanism.

Accessible from both sides of oven.

Ergonomic handle.

Address possible safety issues.

Identify materials appropriate for an oven.



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Thank You



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