



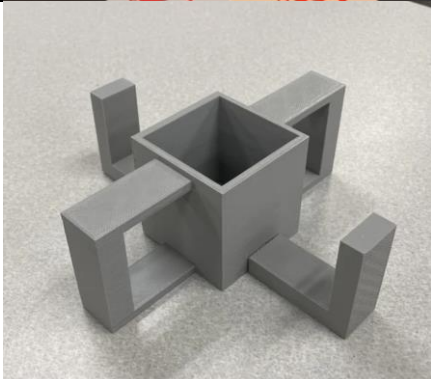
Milk Carton Opener

DESIGN RATIONALE

Introduction

The Milk Carton Opener allows users with limited grip strength to open plastic 2L cartons such as the ones used for milk and juice.

Research

| Name | Picture | Price | Link |
|-----------------------|---|------------|----------------------|
| Commercial | | | |
| Tip Top Carton Opener |  | \$7.99 USD | Link |
| DIY | | | |
| Milk Carton Opener |  | N/A | Link |
| Milk Carton Opener |  | N/A | Link |

Milk Carton Opener

DESIGN RATIONALE

Requirements

Goals

| | |
|-----|---|
| G01 | Allow users with limited grip strength to open plastic milk cartons with twist off lids |
|-----|---|

Functional Requirements

| | |
|-----|---|
| F01 | Work with both styles of plastic carton lids |
| F02 | Allow the lids to be removed with less force |
| F03 | Provide a better grip than the round lids of a carton |

Constraints

| | |
|-----|-----------------------------|
| C01 | Must be entirely 3D printed |
|-----|-----------------------------|

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DESIGN RATIONALE

Milk Carton Opener V1.0

Design

This version of the design consists of a single 3D printed component with an outer handle and two differently sized gripping surfaces. The outside handle portion is cylindrical with two elongated portions to provide a gripping portion for the user's hands. The inner gripping portions of the aids are slightly conical with rounded ribs around the periphery to provide better engagement with the screw cap.

Print Testing

This design was test printed on a Prusa MK3S in PLA filament without support. The print was successful, though the inner portion has a bit of an unsupported lip and printed with poorer quality.

Functional Testing

The device was tested on a Chocolate Silk Almond milk carton, and was easily able to remove the lid of the carton.

Opportunities for Improvement

- Replace fillets on surface that lies on print bed with chamfer or mixed chamfer-fillet to improve print quality.
- Reconfigure geometry of the inner lip so device prints without support