Abstract

Strain injuries represent a significant portion of workers compensation claims in retail ice cream shops. Our goal was to relieve the repetitive stresses of scooping ice cream by designing an ergonomic ice cream scoop specifically for retail implementation.

Design Development

After settling on a braced design, basic analysis of the stresses and moments was conducted, drawing on strain data from scientific literature [1,2]. Our final design utilizes a brace across the top of the arm and a perpendicular grasp to minimize unwanted and off-axis wrist rotation. An adjustable handle is included for greater comfort and to allow easier access to typical retail ice cream displays. Simple construction allows for safe handling and easy cleaning. High density polyethylene was chosen for the brace due to its strength, non-toxicity and ease of manufacturing.

Analysis

Finite element analysis of our ergonomic scoop reveals that it can sustain moments typical of scooping, while relieving those forces from the wrist. Comparison with a traditional scoop further reveals the effectiveness of the design. Moments exerted upon the wrist are reduced by as much as 45%, and rotation of the hand was eliminated altogether.

Results

An ergonomic retail ice cream scoop that effectively reduces stresses about the wrist. Reduction in moments exerted around the wrist by 45%. The final scoop design better meets the needs and environment of retail use than current offerings.

Acknowledgments

We would like to thank Stephen Laguette, Theodore Shugar, Ph.D., and Nelson Bednersh for their help and guidance with this project.

References
