Grill Smoke Solutions: The Smokie-Dokie

Objectives

- Excessive grill smoke is a health risk and interferes with the outdoor grilling experience. The Smokie-Dokie creates a safer and more enjoyable grilling environment.
- There is no other grill smoke reducing product on the market.
- Market size of 377,000 units based on survey of Baltimore/Washington area

Customer requirements
- Family Safety
- Simple to Use
- Durable
- Low User Input
- Maintenance
- Doesn’t Damage Grill

Un-Obstructive
- Simple Install
- Low Noise
- Low

Engineering Characteristics
- Smoke Reduction Effectiveness
- Power
- Weight
- Dimensions
- Ergonomics

Constraints
- Temperature of Grill
- Maintenance of Grill Functionality
- Size

Prototype and Testing

- The Smokie-Dokie is attached to a grill using a strap (1) as seen in the model. The strap is attached to a bracket, (2), which can slide inside of the slotted box and allow the Smokie-Dokie to be attached to a variety of grills.
- To use The Smokie-Dokie, the user presses the button (3) to activate the fans, powered by the battery pack (4). When the grill lid is raised The Smokie-Dokie redirects the smoke coming out of the grill by pulling the smoke, using two fans (5) positioned on the end of the device, and diverting the smoke to the side of the user. The design is lightweight, weather resistant, heat resistant, and simple to install on the grill.

Prototype
- Used power supply, final design will use batteries
- Substituted thin sheet metal for ease of bending, final design will use thicker aluminum
- Velcro used for straps for ease of adjustment

Testing
- How long it takes to develop steady stream of smoke (Avg. 1.38 sec)
- Angle of smoke deflection from the user’s face (Avg. 59° ±2.8°)
- Temperature of device with respect to time while grill lid was open (Max 124°F)
- Distance of projected smoke

Test Results and Future Work

- The Smokie-Dokie performed better than anticipated during testing
- Exhaust ducts were not required to move smoke from front of the grill area
- Leaving The Smokie-Dokie with the lid completely opened greatly reduced smoke as well

Future Improvements
- Decrease the power need of the fans
- Decrease fan noise
- Improved attachment design

Process Reflection
- Concept Selection
- Following the Product Design Specifications

Decision Characteristics
- Power (18.1)
- Smoke Reduction Effectiveness (14.0)
- Weight (14.0)
- Cost

Final Decision
- Mechanical Fan (0.786)
- Shield (0.700)
- Motor Powered System (1.515)