Retra Diffusion

Overview
S.R. Gray, Inc. discovered a need for improving the current design of commercial and professional hair dryers. Hair stylists use hair dryers for a variety of reasons throughout a typical business day. The heavy use of these dryers requires them to be designed as efficient, reliable and comfortable as possible to reduce fatigue and improve productivity. The objective of this project is to design a new hair dryer prototype that provides solutions to problems that arise when using modern hair dryers.

Objectives
The “Retra Diffusion” will offer multiple improvements for the modern hair dryer and will contain multiple innovative changes, including:

1. A diffuser attachment that securely attaches to the dryer unit. This is the most important objective of the project hence the title “Retra Diffusion”. It will be lightweight and may either snap or screw together to house the internal components and attach to the modern hair dryer.
2. A multiple setting switch positioned on the body of the dryer rather than the handle. This switch controls three temperature settings: cool, warm, and hot.
3. A test and reset button located on the plug for safety measures.
4. A conveniently located cooling button on the upper most part of the handle, away from the user’s grip area.
5. A fully removable filter or vent screen capable of quick and convenient cleaning.
6. A cushioned rubber grip handle that will strengthen the overall grip with minimal slippage.
7. A coiled power cord for convenience.

Approach
• Team Hair Dryer is addressing the shortcomings in a piecewise approach:
  • The customer needs were identified when S.R. Gray Inc. expressed their interest in a redesigned hair dryer that meets their daily needs in their commercial hair dressing industry.
  • Team Hair Dryer created many concepts for each component required and selected various designs.
  • Team Hair Dryer conducted external research for available patents and concluded that after extensive research, the hair dryer team concluded that hair dryers could obtain patents for simple ideas including attachments, button location, and surface design.
  • Team Hair Dryer met with the sponsor once a week for input, comments, and clarification.
  • Team Hair Dryer studied the previous phase of this project and learned form the mistakes to start the design concepts.
  • Multiple CAD models were created until the team reached the desired model. Each component was individually developed in CAD then gathered at the end for the assembly process.
  • Team Hair Dryer fabricated multiple prototypes. The team decided to use SLA material to print each component in a smaller scale then printed the full prototype after altering the previous design from any design errors. A Pre-alpha prototype, alpha prototype, and a final prototype were generated in the process of creating the “Retra Diffusion”
  • The team performed operation testing. Each component was tested individually to make sure it met the design concept and is operational.
  • The team then assembled the full prototype and installed the internal motor and wiring to test the final prototype.
  • Team Hair Dryer tested the functionality of the each component in the final prototype and was very pleased with the results.

Outcomes
• The sponsor will save $682.06 as a result of this project. This was the cost of the entire design generation and prototype printing for the “Retra Diffusion”
• Manufacturing time was reduced tremendously because all of the CAD models are completed and are ready to be printed to start the production process.
• The project reduced set up time, because it only required 3D printing four components: front housing, back housing, diffuser, and the filter system.
• The “Retra Diffusion” satisfied all the patent requirements identified by S.R.Gray Inc. and is a fully operational prototype.