Bath Toy

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Project Purpose

- Create a water-recirculating toy that allows children to safely play with running water
- Toy is self-pumping and provides multiple water outlets, unlike competitors

Past Work

- Patent # 8156578 covers the concept of a recirculating bath toy with interactive features
- Computer models of casing and few interactive accessories

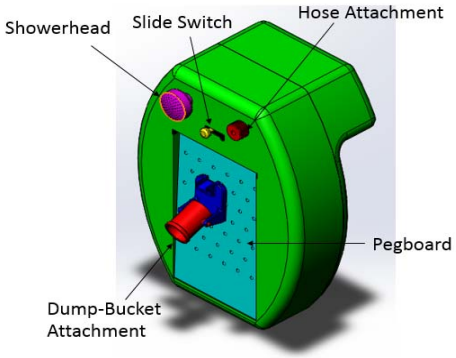

Figure 1 - CAD model of initial concept

System Requirements

- Normal Use and Abuse testing requirements and guidelines in ASTM F963-11
- 3 L/min to 12 L/min of waterfall
- A minimum of 3 interactive features to vary water flow

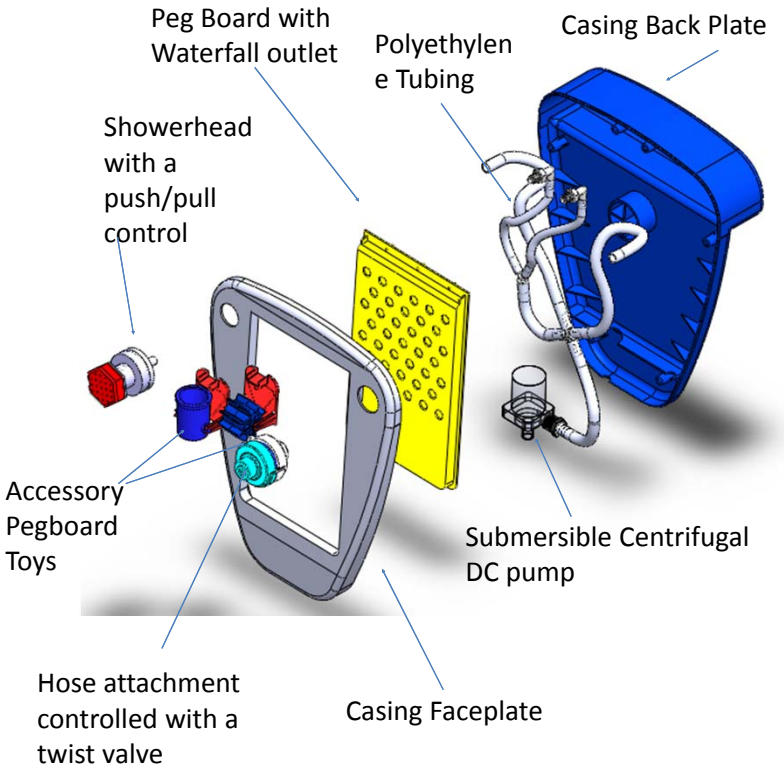

Figure 2. "Bath Toy" Exploded view of final design

Technical Accomplishments

Table 1 – Bath Toy Project Subsystem Accomplishments

Subsystem	Accomplishments
Casing	Modified profile of original design to add structural stability & internal geometries to aid in subsystem waterproofing
Inserts	Integration of functional snapfit to bucket and waterwheel assemblies
Showerhead	1.5 m/s velocity at outlet
Hose	2.5 m/s velocity at outlet
Pegboard/ Waterfall	Eliminated separate waterfall features– lowered PIM cost.
Internals	Final experimental water flow of 66.7ml/s was within the range stipulated by the patent (50-200ml/s)

Future Recommendations

- Change flow rate (1440GPH) to reflect intake from a ½" diameter 25' length garden hose to achieve desired feature effects
- Apply soap to outside surface of pegboard or prepare soapy water to break surface tension of hydrophobic polyethylene
- Apply dental or candle wax to hose and showerhead features to mitigate leaks
- Demonstrate the prototype in three stages: waterfall operational only, showerhead and waterfall operational only and water and hose operational only
- Select an appropriate medium to present the prototype (video vs. physical demonstration)