

FOG FREEDOM

By: **FABBS**
INNOVATIONS

Austin Fisher, John Buchanan, Bill Buth, Sam Stone, & Mitch Ahaus



Problem Overview

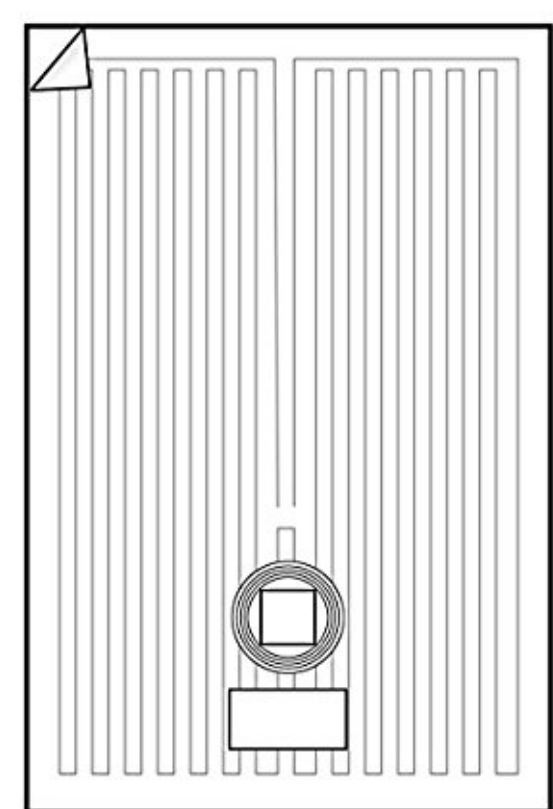
- Bathroom mirror fogging is a persistent daily annoyance almost everyone has encountered
- High bathroom humidity leads to mold and mildew

Targeted Customers

- Hotel Owners
- Apartment Owners
- Home Owners

Benchmarks

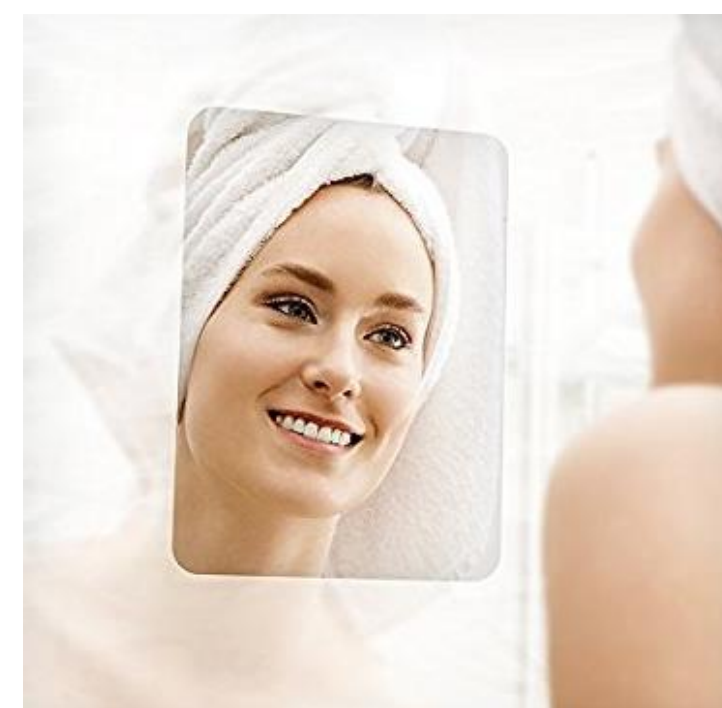
- No product previously patented or currently on the market both dehumidifies and defogs



Heated Mirror Attachment



Manual Wiping



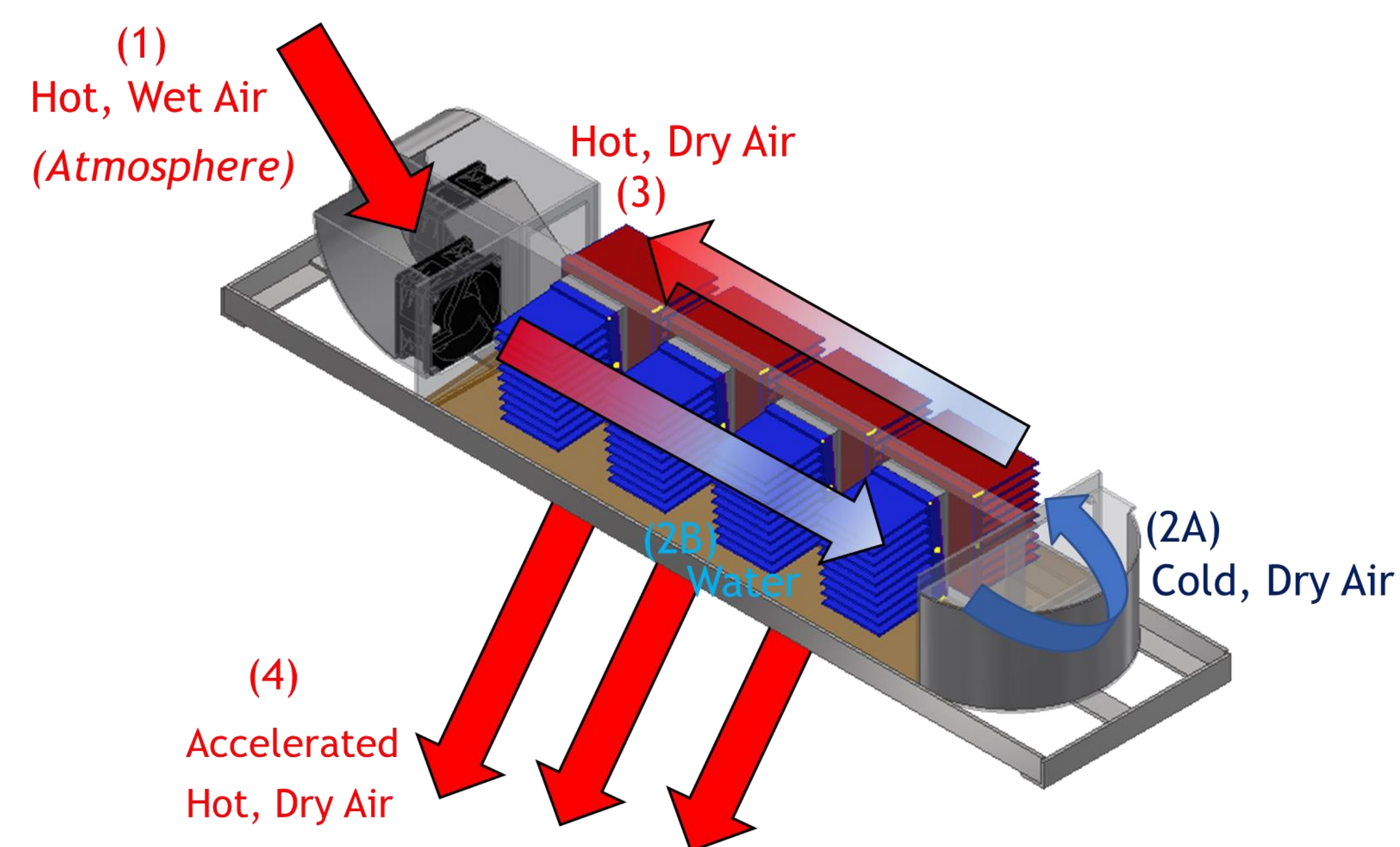
Anti-Fog Film/Spray

Marketability

- Mold and Mildew Prevention:
 - Hotels spend roughly \$150,000 annually on water damage annually
- Improved User Experience:
 - Design will eliminate fog on the mirror
 - Waste heat will warm bathroom
 - Zero user effort required
- Simplified Construction:
 - Removes need for exhaust ventilation

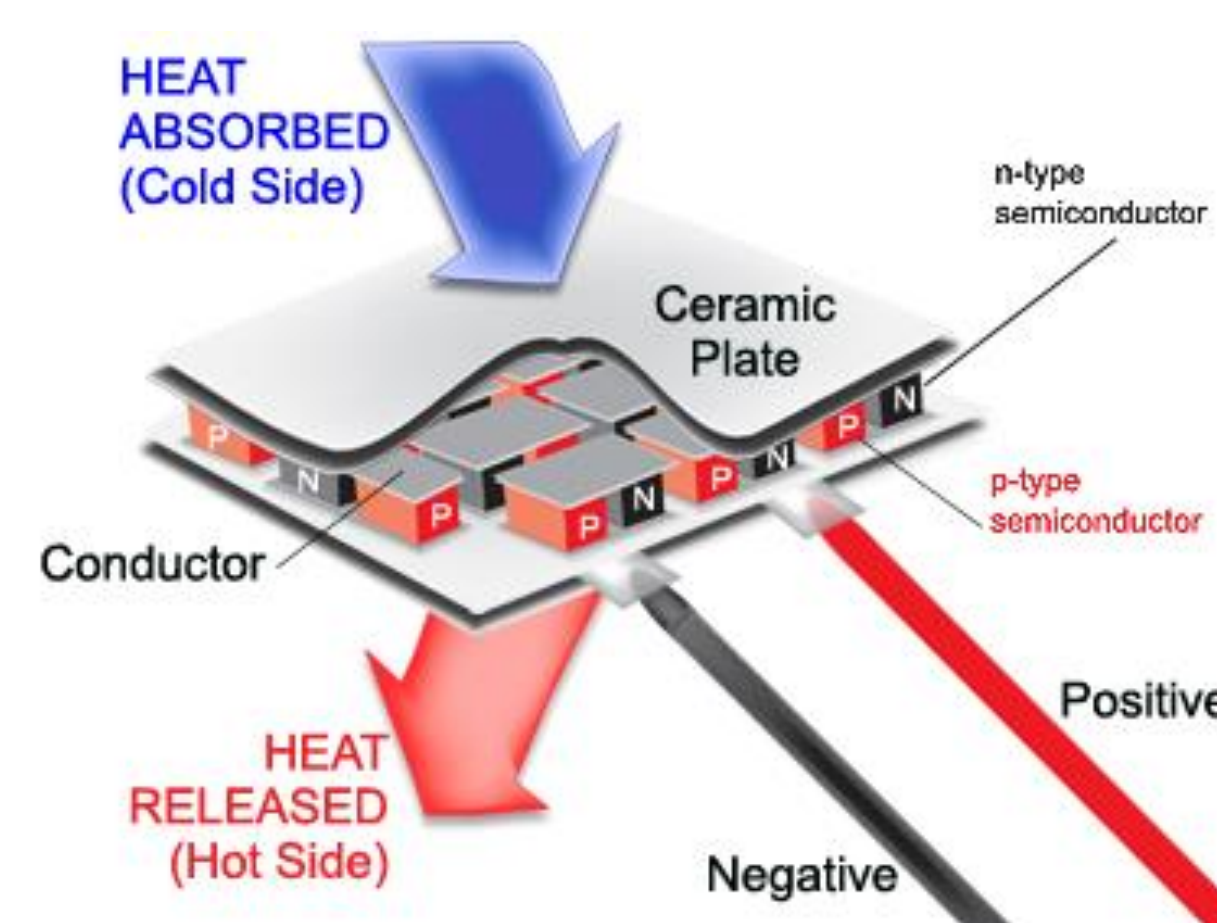
Design Solution

- An integrated dehumidifier, vanity light, and mirror defogger
- Uses waste heat from dehumidification to eliminate a daily problem
- Mounted above the mirror in place of vanity light
- Intakes hot humid air and discharges hot dry air which defogs the mirror



Electrical & Controls

- Dehumidification achieved through Peltier effect
- Voltage supply causes temperature differential across the cell up to 60°C



- Device only turns on when humidity reaches a critical level
- Sensors placed on Peltier cells protect against overheating

Prototyping & Testing

Test 1: Defogging Time

Condition	Defog Time
Ambient	5 min
Device On	2 min



Test 2: Dehumidifier Effectiveness

	mL/day	Power (W)	(mL/day)/Watt
Fog Freedom	1489.29	480	3.10
Della Mini	250	22.5	11.11
Kedsum	260.25	23	11.32
Powilling	700	72	9.72

Cost Analysis

- Goal sell price: \$400

	Prototype	Production
Electronics	\$180	\$55
Fins	\$108	\$35
Ductwork	\$28	\$5
Shell	\$55	\$10
Total	\$371	\$105

Future Work

- Optimizing heat transfer
- Modular assembly to accommodate multiple mirror sizes
- Simplify electronic design and packaging
- Research solutions for condensate recycling/ disposal
- Create variety of aesthetic shells