Compact Laptop Cooling Pad

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Abstract

Laptop cooling is essential to be able to maintain laptop speed at peak use. While many products that provide external cooling for laptops exist in the market the majority of them are bulky, cheaply made, or not efficient over long periods of time. Our goal was to design a cooling pad that would be both portable and more effective than similar products currently available in the market today.

Figure 3. New Design for a Compact Laptop Cooling Pad
Left: Top Right: Bottom

Benchmarking

Two USB-powered ventilation based laptop coolers were tested. Due to the limited transient effectiveness of a laptop cooler based on phase changing materials we discarded this approach from the beginning. The Belkin F5L055 laptop cooler and the Targus Chilmat were tested for weight, size, noise output, and power consumption with a focus on temperature reduction.

Design Requirements

• Overall dimensions less than 11” x 8.5” x 1”
• Final weight no greater than 1.5 lbs
• Cools the CPU by greater than 2.5ºC when running at maximum load
• Max voltage of 5V and current of 500 mA or 2.5W to power cooling pad

Customer Needs

The majority of surveyed customers use their laptops primarily at home, at a desk, and for extended periods of time. It is essential that the cooling pad can run off of the computer’s power through a USB connection, and it is preferred that the cooling device is portable. Because the majority of customers prefer to transport their laptops in backpacks our product must be compact enough for this to be feasible.

Future Recommendations

• Experiment with different fan arrangements.
• Modular fan arrangements for specific laptop models.
• Various aesthetic configurations.

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References: