DUST WAKER
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Abstract

The Dust Waker is a handheld device, designed for the cleaning and maintenance of personal computers. The purpose of the Dust Waker is to provide a reusable alternative to canned air, the de-facto tool used for computer maintenance. It is powered by a dc motor and a 9 volt battery.

Figure 1. The inside of a desktop computer. It gets very dusty which lowers the computer's performance.

Challenges

The Dust Waker needed to be static-free, to avoid damaging electronic components. The motor needed to run at settings high enough to remove dust, while not damaging the surface that it was cleaning. Finally, the shaft assembly needed to be rigid enough so that it would not significantly deflect while the device was in operation.

Overcoming Challenges

To address the issues created by static electricity, material selection was key. For the brush-head, we identified two types of non-static cloth. As for the shaft, we considered both wood and plastic, opting for the latter, since it was easier to machine. The motor could be run at either 9 or 18 volts; however the 18 volt setting damaged our test surface, making 9 volts the obvious choice. Early iterations of the shaft would deflect due to small asymmetries within the assembly. To reduce this deflection, we increased the rod diameter in subsequent iterations.

Figure 2. Left: Can of air. (mainstream computer duster) Right: Dust Waker. (New and improved duster)

Figure 3. Several of the different ideas we explored to determine final brush design

Figure 4. Left: Wooden sample (hard to center hole and too abrasive for delicate material in case of accidental contact) Middle: Nylon tubing with tick base for stabilization. (Still significantly deflected) Right: Nylon tubing with thick tubing up to the brush (for better stabilization.)

Figure 5. Comparison test of Dust Waker with canned air (black heat sink)

Results

Testing has shown that the Dust Waker performs on par with, and in many cases better, than compressed air. It is far more effective at removing thicker layers of dust than compressed air. It's only short-coming being that it is difficult to use in tight spaces, a problem that, given more time and resources, we would address by making the shaft repositionable, and the casing more compact.

Objectives

First, we identified several key parameters for our design. It needed to be able to outperform canned air, in terms of cleaning, while still being inexpensive so that it could be marketed at a competitive price. Additionally, the Dust Waker needed to be able to reach tight spaces without damaging either the computer or itself in the process. Finally, it needed to be easy to use.

Figure 5. Comparison test of Dust Waker with canned air (black heat sink)

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