



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

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Project Title Blowout: Acoustic Fire Extinguisher	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The scientific exploration of Unconventional Fire Extinguishers is full of exciting unexpected responses. The term "Unconventional Fire Extinguisher" is used to describe an unorthodox fire extinguisher. This year's project is to extinguish the flame on a candle using acoustic energy.</p> <p>Methods/Materials The acoustic fire extinguisher is a two part apparatus. The core of the apparatus is a Goldwood GW-12PC/8 8 ohm 12 inch Woofer Speaker Driver enclosed in a casing made out of 5/8 inch plywood. Attached to the casing is an acoustic amplifier designed to increase the dynamic pressure created by the driver. A Nikko Integrated Stereo, DC Amplifier model NA - 2090 amplifies the signal generated by the MacBook Pro laptop and directs the signal to the driver. The acoustic energy generated by the apparatus works by blowing the flame off the fuel source and by creating a vacuum around the fire, suffocating the flame. The acoustic energy produced by the apparatus is sufficient to extinguish the flame on a candle at the minimal power setting of the amplifier.</p> <p>Results The result of the scientific investigation was the apparatus successfully extinguished the flame on a candle in 2-5 seconds with minimal amplifier power.</p> <p>Conclusions/Discussion The acoustic fire extinguisher has the potential to revolutionize fire suppressions systems in critical environments such as data centers and spacecraft. The acoustic fire extinguisher projects a focused stream of high velocity air at the target flame that both blows the flame off the fuel source and suffocates it. The application of this technology has the potential to save tremendous resources because it is nondestructive and requires no chemicals, solutions or dangerous substances to extinguish a fire.</p> <p>Employing advanced fire detection systems such as infrared imaging and high speed computers to detect the first sign of a fire, the automated acoustic fire extinguisher will suppress a fire at the instant it is discovered saving human life and critical resources.</p>	
Summary Statement This project demonstrates the viability of extinguishing the flame on a candle using acoustic energy.	
Help Received My father provided advise and encouragement.	