

## **R-8009**

**Lead Inventor:** Harbans Dhadwal, Ph.D., Associate Professor, Department of Electrical and Computer Engineering

**Title:** Hair Removal Device Utilizing Coherent Imaging Fiber Technology

**Background:** Laser and other optical techniques for hair removal are based on non-selective thermal damage of the hair shaft and / or hair follicle by absorption of optical energy. Existing commercially available systems flood a large area of hair populated skin with the anticipation that some percentage of the incident energy will be absorbed by the hair shaft, thereby resulting in hair depilation. As a result, the surrounding tissue temperature increases significantly requiring external cooling and / or control of the optical pulse repetition rate.

More recent portable devices, aimed at the consumer and non-medical facility markets, are designed to delivery optical energy directly to the hair shaft. Some of these devices incorporate imaging capabilities to identify treatment area, others do not. This technology utilize the cortex and medulla regions of the hair shaft and the outer root sheath to transmit both optical and thermal energy to the bulb region of the hair follicle for destruction of growth initiating cells.

**Technology Description:** Professor Dhadwal's device makes dual use of the coherent imaging fiber; first for capturing the image of the treatment area and then for transmitting the required dose of optical energy to facilitate hair depilation. This compact hand-held device targets one hair at a time and therefore only requires a laser with a low peak power output. The laser diode incorporated into this system is rated for 100mW, compared to commercially available devices which require lasers with power output of 1 to 5 W.

**Applications:** Hair removal device for non-medical facilities such as salon, spa and home markets.

**Advantages:** Hand-held, Portable, Low Power Requirement, Specific Treatment Area, Low Cost

**Patent Number / Publications:** Patent Pending

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