



2004 MDA Technology Applications Report

REPRINT



Mountaineering

Quoin International, Inc.
Carson City, Nevada

Do you remember how hard it was to climb a rope in gym class? Now imagine that rope is 600 feet long, and you are hauling up someone in a basket-stretcher with you. Today, mountain search-and-rescue groups must rely on ropes, pulleys, and human strength to perform rescues. However, that may soon change.



▲ *The China Lake Mountain Rescue Group is demonstrating the prototype PowerQuick™ Powered Ascender. The rescue group has provided input and testing results to Quoin throughout the development of the PowerQuick technology.*

China Lake Mountain Rescue Group (CLMRG) has been testing the PowerQuick™ Powered Ascender, a device capable of propelling a person up a rope or lifeline, from Quoin International, Inc. In April 2000, CLMRG rescued a seriously injured climber from Mount Whitney, the highest mountain in the contiguous 48 states, with a summit of 14,497 feet. The climber had taken a 40-foot fall and was stuck 600 feet below the summit. Reaching the summit at noon via helicopter, CLMRG administered medical treatment and secured the injured climber to a stretcher. The team began hauling up the climber at 6:30 p.m.; at 2:00 a.m. the stretcher crested the top of the mountain. If CLMRG had the PowerQuick device, the injured climber would have been safely at the summit about 15 minutes after the rescue team arrived.

PowerQuick™ Powered Ascender

Description: Lifting technology capable of propelling a person and equipment up or down a length of rope or lifeline at speeds of 1 meter per second

Price Range: \$4,900

Customer Base: Search-and-Rescue groups, Defense, construction companies

Benefits: 1. Light-weight—approximately 7 pounds, 2. Capable of propelling up to 408 pounds at a rate of 1 meter per second, 3. Controllable descent and ascent, which increases safety

Additional Applications

Construction: Can be used to lift men and equipment to sites needing construction or structural repair

Defense: Can provide military personnel quicker and easier access to tall structures during defense procedures

Attitude Control System

The National Park Service and volunteer mountain rescue groups face many situations in which a rescuer must descend into remote places to save a life. Oftentimes the equipment necessary to get a person out of harm's way proves to be cumbersome or useless. Winches on ground-based rescue vehicles are worth little if the vehicles can't access victims in remote areas. A large winch on a helicopter can add significant weight, leaving less room for supplies or people. Moreover, a rope wrapped around the capstan of a winch can become tangled and cost serious life-saving time. Quoin's Tactical PowerQuick device—based on a flywheel-based attitude control system (ACS)—works by propelling a person along a length of rope or lifeline rather than winching all the rope onto a capstan at the other end. It is a man-lift technology that is powered by a turbine and high-pressure air (compressed air or air generated by a solid

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Company Vision

“Quoin International’s goal is to continue development and commercialization of dual-use technologies. We will manufacture and market some products in-house, such as the PowerQuick powered ascender, and others such as the flywheel attitude control system will potentially be licensed to a major defense contractor. The overall goal is to increase the company technology base and provide a healthy return to our investors.”

Cathy Jacobson,
VP Business Development

propellant). Both the air source and the turbine are built into a single unit, the ACS. A miniature, compressed-gas turbine was developed as a starter mechanism for the attitude control device’s flywheels. The turbine drives the flywheels at more than 100,000 revolutions per minute. Through a series of stages, the turbine converts the energy of compressed gas into rotational mechanical energy. The PowerQuick device can be incorporated into a variety of lifting chairs or other platforms.

MDA APPLICATION

Year Funded: 2000

BMDO, now MDA, funded Quoin to develop its flywheel-based attitude control device to replace conventional stabilizing thruster technology in missiles and satellites. Using the theory of gyroscopic force, the system can induce torque in a missile to control pitch, yaw, and roll. Currently, command of kinetic energy kill vehicles is achieved through the use of divert attitude and control thrusters whose exhaust gases decrease the sensitivity of the vehicle’s infrared sensors. Quoin’s technology reduces the number of thrusters needed for attitude control, thereby restoring some infrared sensitivity. The flywheel device is also 70 percent lighter and 80 percent cheaper than conventional thrusters.

Company Profile

Business Overview: Quoin is an engineering, technology development, manufacturing, and service company that specializes in power, control, actuation, and pyrotechnics technology.

Founded: 1990

Employees: 25

2003 Revenues: \$2 million

Facility: The company has a 5,000-square-foot facility in Ridgecrest that houses the headquarters and engineering services and a manufacturing/testing facility in Inyokern, CA, for the production of Quoin’s FireQuick flares.

Partners: None

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