



SUMMER MOVIE SPECIAL

Scary Monsters Dissected! Sci-Fi Facts Checked! Multiple Futures Revealed! p.70

POPULAR SCIENCE

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Hot Products



A 21st-Century View-Master p.20

THE FUTURE NOW

5TH ANNUAL

INVENTIONS

OF THE YEAR p.49

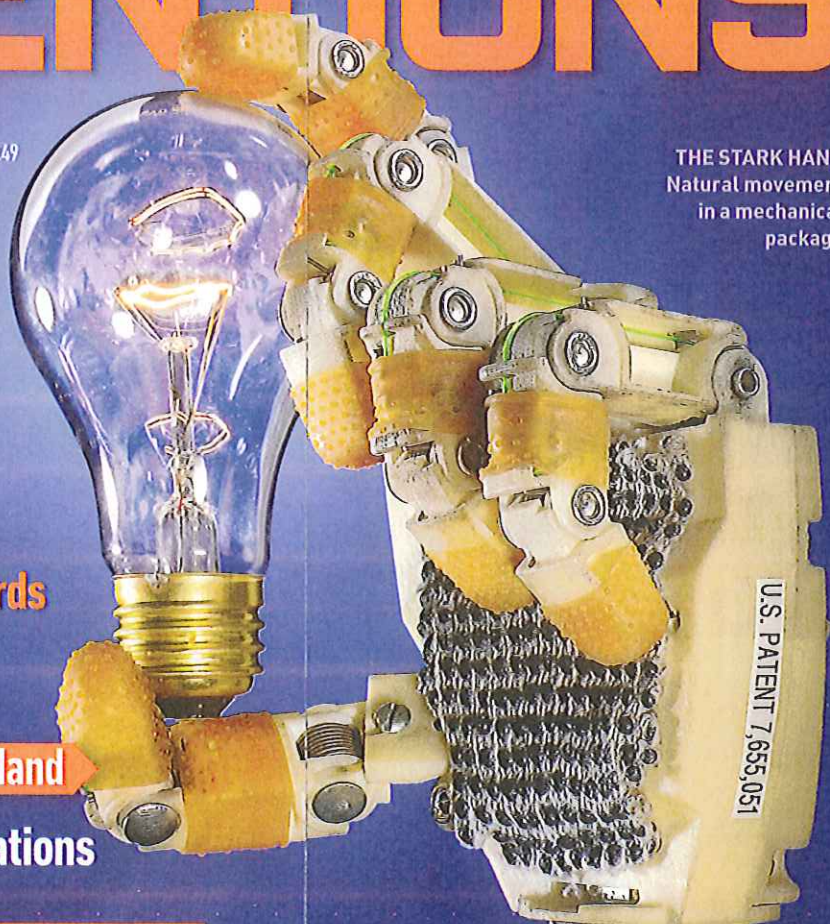
Meet the Garage Tinkerers behind:

- ▶ Armored Stun Gloves
- ▶ Snowboarder Airbags
- ▶ Print-Anywhere Inkjets
- ▶ Never-Glare Sunglasses
- ▶ Jet-Powered Boogie Boards
- ▶ Disease-Detecting Pens
- ▶ Bedbug Sniffers
- ▶ The Low-Tech Prosthetic Hand

And Other Amazing Innovations

PLUS: Darpa's Hummingbird Spies p.34

Killer Escalators p.99 High-Speed Fungus p.37

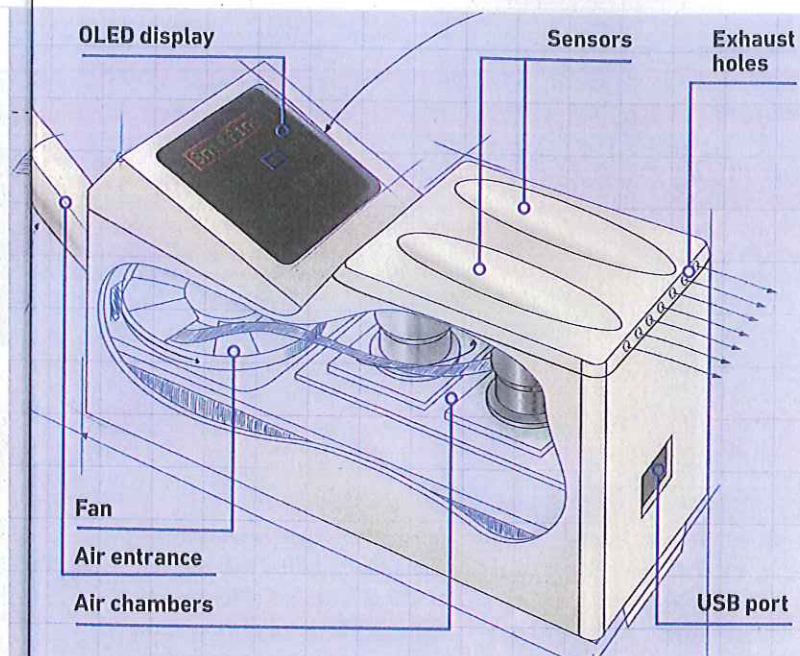


THE STARK HAND
Natural movement in a mechanical package

JUNE 2011 US\$4.99



Product



HOW IT WORKS

A fan sucks air in through seven small holes in the wand. The air comes into contact with three sensors capable of detecting a bedbug's unique aromatic signature, a com-

bination of pheromones, CO₂, and methane. Software monitors and adjusts the system, and a color display shows when the user is getting closer or farther from the source.

a scent into the smaller of a dog's two olfactory chambers; over time, faint aromas build up in the chamber and become recognizable to the animal.

Exterminators in the U.S. currently employ around 200 dogs, a number that's on the rise. But the training and care for a dog can run a pest-control company between \$30,000 and \$70,000, according to the National Pest Management Association, a cost that's generally passed on to the customer. Since training isn't regulated, some dogs do not learn to find bedbugs adequately. Those that do can locate an infestation to only within a few feet, which still leaves a lot of space that must be searched by

hand. Dogs also don't distinguish between male and female pheromones (egg-laying females pose the highest infestation risk) or sense other signatures such as the insects' odorless carbon dioxide and methane emissions.

Goggin's electronic version uses CO₂ and methane sensors, as well as a proprietary pheromone detector, to pinpoint bedbugs to within one square inch, from a distance three times as far away as a dog could. The device can also tell the bugs' sex. The handheld unit will go on sale this year for \$200. Goggin says a new model that works for a wider variety of pests, including cockroaches, ants and mice, is on the way.

—BROOKE BOREL

Where Inventions Are Born

Three organizations that specialize in getting the next million-dollar idea off the ground—AMANDA SCHUPAK

eSpace: The Center for Space Entrepreneurship Boulder, Colo.; espacecenter.org

Provides aerospace start-ups with fundraising connections at NASA and elsewhere and access to equipment such as cleanrooms and a vacuum chamber that duplicates conditions in space

SUCCESS STORY

■ Zybek, which developed a new milling process and now supplies NASA with synthetic regolith, or moon dust, for testing machines in lunarlike conditions

IN THE PIPELINE

■ Next Giant Leap, whose moon lander is in the running for the \$30-million Google Lunar X PRIZE

Environmental Business Cluster (EBC)

San Jose, Calif.; www.environmentalcluster.org

Helps commercialize clean-energy and green-tech products. In addition to providing office space and legal counsel, EBC sets up inventors with strategic business partnerships and investor networks.

SUCCESS STORY

■ Digital Sun's S.Sense, a sensor that sticks into your lawn, measures moisture levels and wirelessly activates the sprinklers only when the grass is thirsty

IN THE PIPELINE

■ Alphabet Energy, which has raised more than \$1 million for its thermoelectric semiconductor platform. The innovation recovers heat lost in industrial facilities and converts it into electricity.

Innovation Works

Pittsburgh, Pa.; innovationworks.org

Invests up to \$600,000 in seed funding for tech start-ups. The incubator's accelerated AlphaLab offers workspace and support for burgeoning mobile and Web companies. The "virtual" program furnishes capital and consulting to inventors remotely.

SUCCESS STORY

■ Plextronics, a company that makes photovoltaic and conductive inks for use in equipment such as solar cells and OLEDs

IN THE PIPELINE

■ Carmell Therapeutics, which is developing a plastic patch, made from blood plasma, for treating bone and cartilage injuries

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