



USPTO Announces 2018 Patents for Humanity Winners

August 9, 2018 Press Release 18-15

WASHINGTON– The United States Patent and Trademark Office (USPTO) today announced the latest winners of the Patents for Humanity program. The [Patents for Humanity program](#) was launched by the USPTO in [February 2012](#) as part of an initiative promoting game-changing innovations to address long-standing development challenges.

“Each of these recipients showcases the power of innovation to help the less fortunate around the globe,” said Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office Andrei Iancu. “By recognizing and honoring these innovators whose creativity and curiosity dared them to solve some of the toughest humanitarian challenges, we hope this program will continue to inspire countless more to follow in their footsteps.”

The Patents for Humanity Award is the USPTO's top honor for applicants best representing the [Patents for Humanity](#) criteria. Award recipients receive public recognition at an award ceremony arranged by the USPTO. They also receive a certificate to accelerate certain matters before the Office. Honorable mentions are made to applicants with promising accomplishments who may qualify for an award in future years with further developments. Entries were received in five categories representing pressing global needs: medicine, nutrition, sanitation, energy, and living standards. The award ceremony is scheduled for the fall, with arrangements forthcoming.

Following is a list of the 2018 Patents for Humanity winners:

USPTO recognized nine winners and six honorable mentions in the 2018 Patents for Humanity awards. The award winners are:

Medtronic for creating a portable, low-water kidney dialysis machine for potential use in a wide variety of care settings, including those that lack the infrastructure required for traditional dialysis.

U.S. National Institutes of Health for creating a low-cost, temperature tolerant rotavirus vaccine for use in developing countries, with 3.8 million doses ordered by the government of India's childhood immunization program.

Little Sparrows Technologies for creating a portable low-cost phototherapy device for treating jaundice in infants, which causes 100,000 newborn deaths a year.

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Kinnos Inc. for creating time-sensitive color chemicals to ensure proper disinfection procedures by health workers in Ebola treatment centers and other health care settings.

Russell Crawford for creating tools for low-cost drilling of water wells to reach deep aquifers free from soil contaminants.

Brooklyn Bridge to Cambodia Inc. for creating an affordable rice planting device that helps Cambodian farmers improve their crop yields, and which minimizes the number of farmers, mostly women, who have to work in the most exhausting and unhealthy conditions.

Solight Design for designing a portable solar light that has been distributed to over 200,000 people worldwide including many in refugee camps.

Sanivation LLC. for designing a waste processing plant that transforms human waste into sanitary briquettes that replace wood and charcoal for heating and cooking, with four plants serving 10,000 people in Kenya by the end of the year.

Because International for distributing 180,000 pairs of resizable shoes in over 95 countries, with local manufacturing taking place in Ethiopia and plans for Haiti and Kenya.

More details on each award winner below.

Medtronic

Chronic kidney disease affects more than 700 million people worldwide, and millions die each year from lack of treatment. Developing countries in particular lack suitable treatment options outside of major cities. To address this, Medtronic — one of the world's largest medical technology, services and solutions companies — is creating a compact, portable kidney dialysis machine for use in a wide variety of care settings, including those that lack the infrastructure needed for traditional dialysis. The device in development weighs about 50 pounds and is the size of a large suitcase, making it roughly 10 times smaller and lighter than conventional dialysis machines. It is designed to only use approximately 20 liters of potable water per treatment, which is 75 percent less than current systems. The machine is designed to be affordable and expand patient access in more parts of the world. In China, this device was granted priority status in 2017 under the innovative device pathway, also known as the Green Channel. Medtronic also intends to seek regulatory approval in other regions of the world.

U.S. National Institutes of Health

Rotavirus is a disease that affects nearly every child worldwide. While most cases have mild symptoms, it is responsible for one third of infant hospitalizations for severe diarrhea and kills an estimated 200,000 children a year, mostly in developing countries. Researchers at the National Institute of Allergy and Infectious Diseases (NIAID) at the National Institutes of Health (NIH) developed vaccine formulations to address the six most common forms of rotavirus. In 2005, they partnered with the Serum Institute of India Limited (SIIIL), one of the largest vaccine manufacturers in the world, to produce the affordable RotaSIIIL vaccines in India for use in developing countries. The vaccine is suitable for use in developing countries, lasting up to two years without refrigeration. The government of India has ordered 3.8 million doses for their Universal Immunization Programme.

Little Sparrows Technologies

Severe jaundice causes over 100,000 preventable deaths annually among infants in developing countries. Those who survive often suffer permanent neurological damage. The standard treatment devices are expensive and not suitable for low resource settings. Dr. Donna Brezinski set out to create a portable, affordable phototherapy device that could be used in rural regions. Her Bili-Hut device uses blue LED lights in a reflective bassinet or tent that can run on battery power. The device is built from off-the-shelf parts and is collapsible for transportation. Dr. Brezinski founded Little Sparrows Technologies in 2014 to provide Bili-Hut devices worldwide after receiving seed funding from the Saving Lives at Birth Grand Challenge. Following further testing and refinements, the devices have been used at locations in Burundi to treat jaundiced newborns. Little Sparrows has received two phases of funding from the NIH's Small Business Innovation Research (SBIR) program and is working to increase manufacturing. The World Health Organization included the Bili-Hut in its Compendium of Medical Devices for Global Health.

Brooklyn Bridge to Cambodia Inc.

Subsistence rice farming in Cambodia is a labor-intensive activity in order to plant each seed properly below the soil. The work is mostly done by women, standing long hours in water and mud exposed to parasites. As younger people increasingly move to cities for better jobs, farmers must resort to expensive and inefficient methods like scattering seeds rather than planting them, which substantially reduces crop yields. In 2007, the non-profit Brooklyn Bridge to Cambodia (BB2C) was formed to provide these subsistence farmers with better tools to improve their harvests. Engineers at BB2C created the Eli Rice Seeder, a low-cost mechanical planting device that uses high-pressure air blasts to shoot rice seeds under the soil at regular intervals. The device can be carried by hand, or mounted on a cart or tractor. Using the rice seeder can save up to 250 kilograms of seeds per hectare, worth about \$200, and reduces the planting time from 320 hours to just two hours. The seeder device, which is sold for \$940, can be purchased by groups of farmers and shared among them or rented out to others. The devices are manufactured in Cambodia with local labor and materials. BB2C conducts demonstrations and trainings across Cambodia and supports farmers after purchase. Use of the Eli Rice Seeder improves crop yields, reduces exposure to parasites, increases income, reduces pesticide use, and reduces physical ailments among Cambodian women. BB2C has also begun a partnership with the International Rice Research Institute to help spread the Eli Rice Seeder throughout Southeast Asia.

Kinnos Inc.

During the Ebola outbreak in 2014, one out of every 20 deaths was a healthcare worker who contracted the disease while treating infected patients. This loss of healthcare personnel in West Africa has been estimated to cause an additional 25,000 deaths per year. Effective disinfection of surfaces in treatment centers is a top priority for health services around the world to prevent the spread of communicable diseases. Students at Columbia University addressed this challenge by creating chemical additives to improve surface disinfection with chlorine. Their Highlight additive turns the disinfectant blue so workers can verify surfaces are completely covered. The color fades after a predetermined time to ensure the disinfectant remains in contact long enough to kill all pathogens. Their solution improves the ability of untrained workers to properly disinfect surfaces, and can detect when insufficient concentrations of disinfectant are being used. Kinnos Inc. was founded to commercialize this technology. Highlight has been used at Ebola treatment centers in Liberia and Guinea, in Haiti for cholera, and in Uganda and Democratic Republic of Congo. The Fire Department of New York HazMat team has also adopted the product, and Highlight will soon be launched for use in hospitals.

Russell Crawford

Access to clean drinking water is a problem for over 800 million people worldwide, and kills many people each year. A common solution to the problem is drilling wells. However, most wells are "shallow wells" that become contaminated with mud and debris from the surface, which can bring dangerous

chemicals such as arsenic into the water supply. Standard drilling equipment and techniques limit the depth of these wells in rural regions. As a result, estimates suggest that 30 to 50% of wells drilled in Africa are no longer suitable for drinking water. Russell Crawford set out to fix this problem after spending his career in the drilling industry. He designed a drilling method to reach deeper aquifers hundreds of feet deep and avoid contamination while being inexpensive, easy to transport, and capable of use by two drillers without heavy equipment. Mr. Crawford licensed his technology to the Institute for Transformational Technology at Lawrence Berkeley Laboratories. He spent a month in India and Zimbabwe teaching locals how to operate his drill. He has also licensed his technology to others for use in Mexico, Brazil, Peru, and the United States. Small businesses in Africa are using his drilling technology to generate income for poor families. He has created a charity One Million Wells that provides drilling equipment and instruction at no charge in developing countries.

Solight Design

Access to light during the night affects 2.6 billion people without reliable electricity. Displaced people are particularly affected, with nighttime attacks a danger in refugee or disaster relief camps, especially for women and children. Columbia University architecture professor Alice Min Soo Chun designed an ultra lightweight, portable solar lamp that could be distributed to people living in relief camps and carried with them as they change locations. Two models of solar lamp, one inflatable and the other foldable, are sold Alice's company Solight Design and two other companies (Luminaid and Mpowerd) created by her former students. Her lights have been distributed for disaster relief in 25 countries since 2010, including Greece, Turkey, Ghana, Ecuador, Uganda, Haiti, South Africa, Cameroon, and Nepal, by working with NGOs such as United Way and Operation Blessings.

Sanivation LLC

In developing regions, up to 90% of human waste is disposed of untreated. Diseases spread by human waste are the second leading cause of death for children under five. Sanivation saw the potential to solve not just this waste disposal problem, but to turn human waste into a fuel product that benefits communities. This social enterprise based in Kenya designed a treatment plant that processes human waste with solar thermal energy to create charcoal-like briquettes for cooking and heating needs. They have setup three plants in Kenya which provide 2500 people a month with sanitation and energy services that are more cost-effective than alternatives. Their briquettes burn longer than charcoal and produce one-third the carbon monoxide and particulate emissions, saving 88 trees per ton sold. Sanivation's work has been supported by the US Centers for Disease Control, the UN Refugee Agency, the Gates Foundation, and the Kenyan government. Sanivation is building additional plants with the goal of serving 1 million people by 2022.

Because International

Soil-transmitted illnesses affect over 1.5 billion people in the world, many of whom are children who simply don't have a pair of shoes. These illnesses can lead to nutritional and physical impairment, inability to attend school, and physical suffering. Because International is a non-profit dedicated to providing shoes for children in poverty. However, shoes donated from industrialized countries do not always work well: children outgrow donated shoes, and they often fall apart. To remedy this, Because founder Kenton Lee designed an adjustable sandal-like shoe that can be expanded as a child grows. The shoes can be made with local materials and last for years. Over the past 3 years, Because International has distributed 180,000 pairs of "The Shoe" to children in over 95 countries. They recently started producing shoes in Ethiopia, providing jobs for impoverished communities, and plan to open other facilities in Haiti and Kenya soon.

Following is a list of the 2018 Patents for Humanity honorable mentions:

Shift Labs for developing an electronic device that monitors the amount of intravenous medication given during gravity infusions to replace un-monitored delivery in areas with healthcare worker shortages.

Case Western Reserve University for creating a portable, quick hemoglobin scanner that can detect sickle cell and other blood conditions

Vanderbilt University for distributing antibodies for Zika virus to other researchers to develop vaccines and treatments

Centers for Disease Control and Prevention for creating a low-cost, simple-to-assemble, and easy-to-maintain mosquito trap to reduce the spread of diseases in resource limited settings.

Folia Water Inc. for developing an inexpensive paper water filter and holder that is affordable to low income customers and can be distributed to urban and remote areas for removing pathogens

Prof Arup SenGupta of Lehigh University for creating economically sustainable Hybrid Ion Exchange Nanotechnology to mitigate arsenic and fluoride crisis of contaminated groundwater in South & Southeast Asia.

For more information on Patents for Humanity, including the latest announcements and info about the program, visit <http://www.uspto.gov/patent/initiatives/patents-humanity>.

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