

# PCT PORTRAITS

## The People Behind the Patents

*More than 1.2 million international patent applications covering new technology of every description have been filed since the Patent Cooperation Treaty (PCT) began operating in 1978. In our series of snapshots, WIPO Magazine selects a few of the inventions and seeks out the people behind them. In this edition, we find innovative engineering techniques applied to architecture, neurosurgery and train travel.*

### On Track for Safer Trains



Photo: Apurva Bahadur (2005)/Indian Railways' Fan Club

**The Raksha Kavach anti-collision device is now installed on all routes of India's Konkan Railway.**

Mumbai, 1999 – another train collision on India's western coast shook the Konkan Railway Corporation. Something had to be done. "We could not allow another life handed to us in trust to be lost in another accident routinely classified as human failure," declared Bojji Rajaram, then managing director of the railway.

Mr. Rajaram, an engineer with a track record of innovation, refused to believe that no technical solution could be found. Surely, he thought, in this age of instant radio communication, microprocessors and Global Positioning System (GPS) technology, it must be possible to devise a fail-safe system. Setting himself a "war like target" of 90 days to produce a prototype, he began work on a device which, mounted on two approaching

trains, would enable them accurately to assess each other's course and, in case of collision risk, to initiate an automatic braking system.

"The toughest challenge," Mr. Rajaram relates, "was how to make the GPS, which has only 20 – 30 meters accuracy, differentiate tracks which are only five meters apart." With no local GPS equipment or expertise to draw on, Mr. Rajaram bought a GPS over the Internet late one night, plugged it into his laptop, and enlisted the help of his five year old grandson to wander around the garden with it, while he scrutinized its capabilities. His resulting "Deviation Count theory" confounded the skeptics, and led to his anti-collision device, *Raksha Kavach*. In January 2006, the Indian Railway Ministry announced that the device, already installed on all Konkan Railway routes and many Northeast Frontier Railway routes, was to be extended to the entire broad gauge rail network by 2013.

And why the PCT? "Because," said Mr. Rajaram, "I wanted to save public expenditure, and to take the most cost-effective manner of protecting in a fair manner the IP rights." He cites a total of 17 patent applications, and potential royalty streams estimated by Price Waterhouse Cooper at up to Rupees 8000 crore (over US\$1 billion) over three years. Uninterested by personal profit, however, Mr. Rajaram chose to assign all patent rights to the Indian nation via the state-owned Konkan Railway Corporation.

Now retired, Bojji Rajaram has lost none of his fervor: "I believe," he writes, "it is in the realm of reality to make food, travel, communication and dwelling virtually free to all humans through the bold application of science and technology to infrastructure development."

*For more see: <http://www.atrilab.com/>*

### Healing the Whole Head



Courtesy of Osteopore International

**Used to repair skull fractures, this bioabsorbable mesh implant allows new bone tissue to grow over the damaged area**

A neurosurgeon repairing a skull fracture, or patching a "burr hole" drilled in the skull to drain a brain hemorrhage, will usually use either a titanium plate, or replacement bone taken from the hip of the patient or donor. Problems, including cost and infection risks, are particularly acute in developing countries, where a lack of medical imaging equipment can result in a surgeon having to drill and plug multiple holes to

find the right point. But a team of six doctors and engineers from Singapore's National University, National University Hospital, and Temasek Polytechnic, have come up with a new alternative.

Using a bio-degrading polymer, polycaprolactone, the team engineered a mesh of bio-absorbable tissue, able to plug a hole in the skull, while facilitating the growth of new bone over the damaged area. The mesh can be cut easily to shape, and is significantly cheaper than Titanium plates. Accepting the Gold

## Concrete in a New Light

Concrete jungle, concrete monstrosity... Concrete is one of the world's most ubiquitous building materials, yet its aesthetic reputation has become tarnished.

Challenging such negative perceptions is a young Hungarian architect. Combining artistic inspiration, technical innovation and entrepreneurial flair, Áron Losonczi has created concrete building blocks which transmit light. By arranging thousands of very thin glass fibers in parallel rows, then casting them within the concrete, he enables light to pass through the blocks. The result is a transformation. A solid gray mass becomes a luminous wall, alive with shadows.

"The idea came from a work of art I saw in my hometown, Csongrád," Mr. Losonczi told Associated Press. "It was made of glass and ordinary concrete, and the idea of combining the two struck me. Then I went to Stockholm to do post-graduate work in architecture and devel-

oped it there." He filed a PCT application for his light-transmitting building blocks in 2003.

To market his translucent concrete, Áron Losonczi set up LiTraCon in Csongrád in 2004. It won the Red Dot "Best of the Best" Design Award last year, and is attracting widespread interest from architects, designers and artists. First used in 2004 as a sunscreen in a private house in Budapest, it is now being considered for use in New York's Freedom Tower.

Readers should not expect, however, to see their cityscapes transformed just yet. Production costs and the optic fibre content currently make this a luxury product. But speaking at the "Liquid Stone" exhibition at Washington's National Building Museum in



The play of light and shadow through translucent concrete

Photos: copyright LiTraCon Bt. 2001-2006

January, Mr. Losonczi looked forward to being able to reduce costs through international licensing deals and large scale production.

*For more see: <http://www.litracon.hu>*

See also [www.wipo.int/pct/en/inventions/](http://www.wipo.int/pct/en/inventions/) for WIPO's PCT website Gallery of Notable Inventions and Inventors, featuring a selection of other interesting innovations.

Award at the 2004 Asian Innovation Awards, team member Professor Teoh Swee Hin spoke of "a message of hope" for patients undergoing reconstructive surgery for head injuries.

Clinical trials, described in the journal of the Congress of Neurological Surgeons (February 2006), reported new bone growth filling the porous space within 12 months with no complications. Following successful treatment of some 80 patients, Professor Teoh Swee Hin told us, trials have now been extended to eye

socket reconstruction; and to the treatment of young children suffering from craniosyntosis, in which the skull fails to grow normally.

A PCT application for the Bioabsorbable Plug Implants and Method for Bone Tissue Regeneration was filed in 2004 by the National University of Singapore. Osteopore International, set up to commercialize the applications, estimates the potential global market to be worth over US\$300 million.

*For more see: <http://www.osteoporeinternational.com/>*