

The Inventors

A creative spark, hard work and perseverance are some of the common factors among successful inventors of products for the RV market.

By Terri Blazell-Wayson

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As a boy, Paul Unmack would fall asleep on the couch in his parent's travel trailer staring at the Dometic logo on the refrigerator across from him. Little did he know that three decades later he would destroy that refrigerator – and in the process – ultimately invent something that would help prevent cooling unit failure and refrigerator fires.

Unmack's boyhood spent camping stayed with him even after he grew up, got married, and became a junior engineer with nuclear control systems.

Those experiences even led him to a new career as an inventor when he developed the Absorption Refrigeration Protection (ARP) Control.

Such events are often the spark for



Top: EZ Connector President Joe Cardoza is pictured with the product he helped develop for the trailer and RV industry. A dairy farmer by trade, Cardoza was inspired to develop the EZ Connector from his experiences with bent blades and corroded connections on farm equipment, which like the RV industry relies on towing hitches and connectors.

Above: The EZ Connector is a sealed, corrosion-free, waterproof trailer plug. It is spring-loaded with face-to-face contacts and stays connected by powerful magnets.

someone to come up with something new that fills a need or fixes a problem in the RV industry. Talk to anyone who RVs regularly and they will proudly display a solution they created for some little problem in their RV.

Still, the number of people in the RV community – and indeed among the larger American population – who have invented a product that successfully retails on the market today is rare. The U.S. Patent and Trademark Office estimates that less than 5 percent of patented products ever make money for individual inventors.

That puts Unmack – along with fellow RV product inventors Joe Cardoza, Salman Bawa and Bala Bhaskaran – among a very select group of people. The four men come from different backgrounds, but have all developed products that are now being sold in the RV market.

Mom, Dad ... About That Refrigerator

Unmack's parents bought their camper in 1959 and made plenty of use of it. However, they never used the refrigerator in the unit while they were driving.

"If you tried, the flame would just blow out," Unmack says.

Being an engineer, he figured that problem should be easy enough to fix, so he installed an automatic ignitor on the refrigerator to keep it running while he was driving.

"I destroyed that fridge in short order," he says. "So I set out to find out why."

A series of tests revealed that having even a new refrigerator tilted prevents the coolants from circulating properly, which prevents the unit from cooling properly. The result was the boiler unit within the cooling unit started overheating, which caused the refrigerant to crystalize, which results in clogged tubing in the refrigerant generator, according to Unmack.

"I read that new RV refrigerators are not

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Salman Bawa, director of business development for Advanced Solar Technology Solutions, is pictured with the RV Chandelier product he invented along with Bala Bhaskaran when they were in college together at McMaster University in Hamilton, Ontario, Canada, where they were both pursuing their master's in technology and business.

as susceptible to burning out when off-level," he says. "The manual said it could operate up to two hours that way. I destroyed it in under 20 minutes.

"The chemicals within the cooling unit must circulate continuously, otherwise it will overheat and burn up," he adds. "When the refrigerator is tilted, the chemicals can't circulate properly. There are no pumps to keep it going. It isn't just when you are parked at an angle, either. It can happen when you are climbing a steep grade."

So again, Unmack the engineer set about finding a solution and came up with the ARP.

"It's a device that monitors the temperature of the boiler," he says. "When it starts to overheat, it automatically shuts off the refrigerator until the temperature is back to normal. My product prevents cooling unit failure. That's the most common reason RV refrigerators fail. It sounds simple but it's really quite complex."

There's Gotta Be A Better Way

Dairy farming – not RVing – is what led Cardoza to his invention. Cardoza grew up on a farm and describes himself as a "tinkerer and workaholic."

"I built and repaired equipment that we needed for the farm," he says. "We didn't have any money, but we had time. I could build it cheaper than I could buy it, so that's what I did."

After joining the military, getting married, finishing college and adding three



The RV Chandelier vent light is an LED fixture around ceiling vents that only uses 8.64 watts of power. Launched in 2012, the product is carried today by national distributor NTP-Stag and by Canadian distributor Atlas Trailer Coach Products.



Paul Unmack had a career as a junior engineer with nuclear control systems before going on to invent the Absorption Refrigeration Protection (ARP) Control with help from his wife, Mao, who is a mechanical and welding engineer. Unmack developed the ARP Control as a safety device for RV refrigerators.

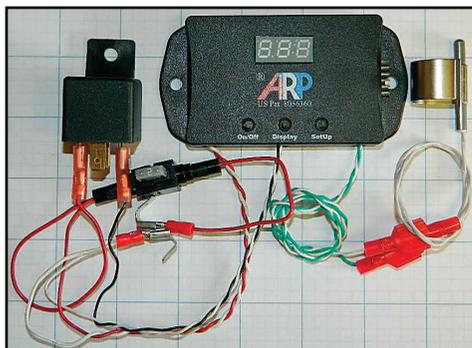
children to the mix, Cardoza went back to what he knew. He leased land and started a successful dairy farm. Like trucks and trailers, farm equipment also relies on towing hitches and connectors for pulling equipment. Cardoza had the same problem as an RVer – bent blades and corroded connections.

Cardoza and his wife would borrow his parents' fifth wheel for weekend excursions with the kids, and found those connection problems across the board.

“Whether it was my parent’s fifth wheel or our farm equipment, they all rely on harnesses and connectors,” he says. “And they all worked the same way – with spades that kept getting bent or water and salt would get inside and they would corrode, or the covers were always getting torn off. We were always replacing them. I kept thinking there had to be a better way.”

One day, while talking with a friend who was a crop duster, Cardoza discovered his friend had an idea and prototypes for that better idea.

“He explained what he was trying to do and I knew I could help with this. He worked on the patent and I made it into a product,” Cardoza says. “He also needed marketing help. I liked the potential of the business, not just for me, but for my kids. They didn’t want to go into farming – they were already in marketing. I saw this as a business that we could work on as a family.



The ARP monitors the heart of an RV refrigerator, the boiler. When the ARP detects conditions that can lead to a destructive or unsafe situation, it turns off the fridge and then restarts it automatically. This is designed to eliminate the chance of the refrigerator catching fire.



So I invested in the business and started a partnership.”

So, The EZ Connector was born of that partnership.

The device is a sealed, corrosion-free, waterproof trailer plug. It is spring-loaded with face-to-face contacts. It stays connected by powerful magnets, according to Cardoza.

Studying & Inventing

Bawa and Bhaskaran met at McMaster University in Hamilton, Ontario, Canada, where they were both pursuing their master's in technology and business.

As international students from Pakistan and India, respectively, they began working on a solar-powered window as a part of their thesis on green power.

RVs weren't exactly at the top of their list of potential markets when they started their research.

“We were researching the concept of a solar-powered window that would provide energy to power items inside of a house,” Bawa says. “We developed a prototype and took it to a show.”

The prototype met with interest, but was not a success for the construction industry crowd.

A few visits to RV consumer shows gave the pair a new idea. How could they provide lighting products that would not be a huge draw on limited power resources?

“Our technology is easily adaptable, but it's very expensive,” Bhaskaran says. “The RV industry embraces new technology more easily, but we needed a product that would be useful while priced for people to buy. We talked to people and we found out that RVers wanted to limit their power usage while increasing the effectiveness of their light output.”

The answer was the RV Chandelier vent

light, an LED fixture around ceiling vents that only uses 8.64 watts of power.

To Market, To Market

Just having a good idea doesn't get a product on store shelves. And just because there's nothing else on the market like a product doesn't guarantee success.

The struggle for many engineers/ inventors is understanding how to get that great idea to market and get consumers to understand what a great idea it is. Suddenly, the inventor isn't just an idea guy, he's a salesman.

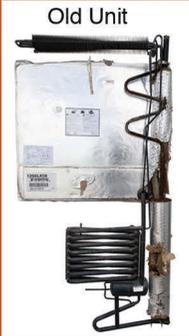
For Unmack, it was a 12-year journey from trashing his parents' refrigerator to the point where he had a fully functional product and was granted a patent in 2012. He and his wife, Mao, who is a mechanical and welding engineer and helped with the process, went through about 20 prototypes.

“Mao worked out the details and got



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the product on the market,” he says. “The ARP Control sounds simple but it is really very complex. The product wouldn’t have existed without the input of both of us.”

The couple has been selling the product for a bit less than two years now through distribution channels as well as consumer direct at events like the massive Quartzsite RV Show.

“Invention has to have a factor of innovation, but needs to include making it marketable. It does no good to invent something that people won’t buy.”

— *Salman Bawa,*
Co-inventor, RV Chandelier

“We now have two different models,” Unmack says. “The basic model moderates the boiling temperature. The deluxe model monitors the fan control also. We sell twice as many deluxe models as the basic.”

For Cardoza’s EZ Connector, things moved more quickly once he entered the partnership with his friend in 2006. By 2007, there was a product.

“We tried direct sales and the Internet at first,” he says. “Then we got distributors and went to wholesale. We aren’t approaching RV manufacturers because, at this point, our connector should not come standard on a trailer. ...

“Offer it as an upgrade option, but not as standard equipment because, right now, they won’t have a truck that will

connect with it,” he adds. “Then you’re stuck. To sell the trailer, you have to offer to upgrade their truck at your expense. Instead, offer our product as an optional upgrade. Have the customer pay for it because they want it.”

Today, Cardoza sells his product via distribution channels to the RV, boat trailer, horse trailer, agriculture, construction equipment, landscaping and snow removal markets. He has been retailing the product since 2008.

Bawa and Bhaskaran started their research for the RV Chandelier in 2012 and brought it to market in 2014, but they credit mentor Bruno Stieg for helping them along the way.

“Bruno is a business strategist,” Bawa says. “Also, Adventec Manufacturing is a company here in Ontario that mentored us. They gave us product development support and

assembly line space. On our own, we could not bring this product to market. We had to surround ourselves with experienced people and companies like Adventec and Bruno.”

The pair also started trying to sell the product online before getting connected with national distributor NTP-Stag and Canadian distributor Atlas Trailer Coach Products.

Though each of these three products has made it to market, there were still bumps in the path. Learning how to properly price a product is a common theme among inventors.

“We started with a very high price point,” Bawa says. “People appreciated the product, but wouldn’t buy it. We had to look into ways to bring the price down. When volume is low, costs are higher.

When volume increases, costs drop. That was a learning curve for us.”

Even something as simple as a product’s name can have unexpected consequences.

“We thought of different names: the Mag Connect, or just The Mag, or other variations around that, but those names were already taken – either as a product or as a website,” Cardoza says. “Plus, we didn’t want to pin ourselves down to just magnetic applications. We wanted a name that meant ‘easy to connect’ so we just called it EZ Connector.

“The funny thing is that in Canada the letter Z is pronounced ‘zed’. So they pronounce our product ‘E – ZED – Connector.’ The ‘Easy’ part doesn’t quite come across in the name,” he says.

Deep Pockets

The four inventors say anyone hoping to get an invention from the idea stage to production also needs to have some serious cash on-hand – or to have a good relationship with someone who does.

Costs associated with developing a product include such things as research, development, molds, machining, prototypes, patents, marketing, and even the cost of getting items included in a catalog.

Unmack estimates he spent around \$300,000 getting ARP to the point where it could be a legitimate product.

“Based on figures from the U.S. Census Bureau, I estimated that there is an average of 1 million RV refrigerators out there — and every one of them needs my product — so the investment is worth it,” he says.

Including costs for trade shows and other travel expenses involved in getting his product in front of potential customers, Cardoza says he has invested \$500,000.

Bawa and Bhaskaran were able to secure a \$50,000 startup grant from the Canadian government through McMaster University, which they used to generate



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prototypes and get the RV Chandelier to market. They say \$10,000 of that went toward applying for a patent, which is pending at this point.

Other costs include packaging, instruction booklets, UPC codes, shipping, brochures and signs.

"It adds up," Cardoza says.

Other Considerations

Even the best product with the best-prepared inventor can run into unexpected problems that can derail a successful launch.

Cardoza nearly had such a problem when he and his original partner didn't see eye to eye on the direction they should take with the EZ Connector.

"We had very different personalities and different ways of doing business," he says. "He wanted to have the product made in China; I wanted to keep it in the U.S. It is U.S. made, by the way.

"My partner also wanted us to manufacture thousands of the same product. It's cheaper that way, but it ties up money in inventory. I wanted to keep the inventory low and see how the industry responded to our product. ... In the end, I bought him out, including the patents," he says.

Also, Bawa says the RV Chandelier had to undergo some redesigns to get production costs down to a point where the product could be reasonably priced for sale.

But each of the inventors of these three products also say the risks and challenges are worth it when they see their products on the retail shelves.

"Invention has to have a factor of innovation, but needs to include making it marketable," Bawa says. "It does no good to invent something that people won't buy."

"Your team has to include people who bring complementary skills that grow the business," Bhaskaran says. "It has to have the right balance. Jim Campbell from Adventec told us, 'Crawl. Walk. Run. Think big, start small.'" **PRO**

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