Photography Julian Kingma

GAME CHANGER

HE'S OUT OF THE PINBALL CAPER – NOW JOHN MASON'S WIZARDRY IS SAVING ELDERLY PEOPLE'S LIVES

By Ricky French

The old clunkers still work fine. They click and they clack and they bang and they clunk. That's their beauty. You just have to care enough to keep them going. *Thwack!* The pinball wizard releases the plunger and sends the ball on its journey. *Ding! Clang! Bip! Clunk!* Three bonus balls roll down but he doesn't swat them. "Let them go, let them go." His hips twist as he punches a flipper into the oncoming ball like a finely timed cover drive to the boundary. The ball crashes into a drop target marked with the letter "W". Good start. The ball rolls back down and the flipper sends it back up the playfield, this time knocking down "H". It rolls back and is once again smacked into oblivion. "O" goes down. The points rack up. That's how you do it. You don't thrash away aimlessly. You build your score methodically. Two bonus balls enter the fray and this time he keeps them alive, juggling them like a pro while casually knocking down three daleks in the Doctor Who-themed game with the third. "There's one! There's two... Three! Got it!" The prize he chases is his: an extra life.

The wizard is otherwise known as John Mason. He's a 48-year-old father of two polite teenagers who lives in a modest suburban home in the Melbourne suburb of Box Hill. Eight years ago he was a maintenance man, wearing rubber gloves, staring into a toilet and thinking: *I'm 40-something years old. How have I come to this moment in my life?*

From no angle does Mason today give the impression of being a wily, skateboarding, pinball-obsessed electronics wiz who's just invented a remarkable, life-saving medical device. It's called Bed Assist. It looks like a whiteboard but it's actually a bed monitor to prevent elderly people falling in nursing homes. He admits it's not a sexy topic; nor is it a new idea. But everyone I speak to says this one actually works. He sold his first five years ago. Now 2200 are in nursing homes around Australia; more than a third of Victorian nursing homes now use them. At $595 each, the orders keep coming in.

While the maintenance man with his hand down a toilet who came to invent his way out of a hole might now be considered a pinup boy for Malcolm Turnbull's "innovation agenda", he's spent most of his time innovating ways to stop his invention from being stolen. And the fight's not over yet.

John Mason's mind may be full of ideas that bounce around like pinballs ricocheting off solenoids, but his home feels empty. Only one pinball machine is left; the rest are gathering dust in a storage shed in Warragul, 100km east of Melbourne. Mason's wife Michelle reckons one is enough in the house. She's not sentimental about the blasted things, even though they gave them a roof over their heads. "Michelle saw them as dollar signs," says John. "I saw them as something nice to keep."

He bought his first machine at 14, the year before he left school in his native New Zealand, for $300: an old clunker called Blue Chip. "I loved the old mechanical ones," John says. Electronics replaced mechanics so he got immersed in the world of electro-magnets, resistors, capacitors, solenoids, everything that was required to keep the ball rolling and the score ticking over. He bought books on electronics and spent his spare time pulling apart Blue Chip and putting it back together.

Obsessed: John Mason with his invention

"Electronics is a language you learn to speak," he says. "Every component is a word. And when the words are in the right order, they mean something."

For more than 20 years John's pinball machines lit up pubs all over Melbourne and gave John and Michelle a future. He'd rent them to pubs and come in once a week to split the takings with the publican, 60/40. Buying, selling, renting, repairing; soon the *ching ching ching* wasn't just bells and tumblers but real money. A healthy little business was born. "We paid off the house with one dollar coins," he says, remembering the halcyon days when Michelle would walk into the bank lugging the sagging backpack, weighed down with the week's pinball takings, sending the tellers diving for cover. But no game lasts forever.

"What was a really good business started declining rapidly. Those classic pubs became more interested in serving coffee and cake." In 2008, with two young children and a dying business, John took a job as a maintenance man in a nursing home up the road, just to make ends meet. "I had a feeling, though," he says. "I knew something would come out of that job. I just didn't know what."

They're not called nursing homes anymore. Or rest homes. And you'd better not call them old folks' homes. Melbourne clinical nurse specialist Teresa Agius sets the record straight. "They're called residential aged care facilities. Write that down." Whatever you call them, Teresa knows they don't get much attention, let alone respect.

She was quality manager when John arrived in 2008, back when Surry Hills Private Nursing Home was a home, not a facility. She remembers John as being unusual among maintenance men in that he took residents for walks around the block on his lunch break. They'd raid nearby gardens and return with bunches of flowers for the nurses. "He was just incredibly caring," she says, "and passionate about doing the best job he could."

It was what he did for Cathy, though, that she remembers most. "Cathy was only 52, but so stricken with multiple sclerosis that her only remaining body movement was turning her head from side to side. John saw that if he could give her back some independence, it would hugely improve her quality of life." He went home and raided a pinball machine for electronic parts: timers, relays and an old scorer that would flick around, changing numbers. He built Cathy a pillow with touch-switches she could activate by turning her head.

"The first switch was to call a nurse," John says. "The next was to turn on the TV, and from there she could flick through the stations, then turn on the radio. Every tilt of her head was like a pinball hitting a switch, clicking over a new score, changing a station."

The invention made him Cathy's favourite person, but it also gave him an idea. Perhaps he could come up with something with a more far-reaching benefit; something truly innovative that would make a difference to more than one person. So he asked the nurses: what?

Falls-related injuries are one of the leading causes of death among older Australians, accounting for more than three-quarters of hospital presentations for people aged over 65. Statistics from the Australian Institute of Health and Welfare show that 98,704 Australians aged over 65 were hospitalised due to falls in the year to July 2013, the most recent figures available. Almost a quarter of those falls occurred in a residential institution. This strain on the health system isn't news to anyone, but falls and their associated costs have continued to rise. The common scenario is a resident getting up in the middle of the night to go to the toilet, with the sudden change in posture causing postural hypotension, or low blood pressure. This is when they fall.

The problem, according to Teresa Agius, is that various bed-monitoring systems have been tried in aged care but few have worked effectively. Teresa says some residents with dementia think pressure-activated floor mats are holes in the floor and step over them. Or pee onto them. Nurses and trolleys inadvertently set them off. Ironically, they're also a trip hazard. But the biggest problem is the timing of the alarm. Once a person is standing on the mat, light-headed after getting out of bed, it's usually too late to stop them falling.

Teresa has seen motion-detecting laser beams that shoot out alongside the edge of the bed, but they could be set off by blankets, or if the bed is moved by a cleaner, or when anyone walks past. She says most devices proved to be so hopeless they'd simply get turned off, either by a nurse or the resident. "No one has been proactive in falls management. There's been no innovation. It was like the problem was too hard to solve."

John the maintenance man thought he'd give it a go and started researching the behaviour of residents who would commonly fall. One man called Roy, according to nurse Keitha Griggs, would fall almost every night. "You wouldn't even hear him fall. But we knew he'd get restless for a period of time before he fell."

John thought that if he could work out the behaviour that led to Roy's falls, he would have a better chance of coming up with something to prevent them. John would wait at home for the night duty nurse to ring him, when Roy was getting restless. He'd jump in his car and drive up. He'd come in and sit next to Roy's bed and just watch him," says Keitha. "First Roy would sit up, then lie down. Then sit up. Then he'd sit up for longer and shuffle to the edge of the bed just before standing up. If an alarm system was to work, that was when it needed to go off, before he got to his feet."

As word spread of John's quest to invent a better bed monitor, more nurses became interested. Their insights would become his most valuable market research tool. John drew up his wish list. "I wanted a device that didn't have an on/off switch; one that was fully automated, so a nurse never had to touch it. It would have to be tailored to an individual, so it can be set to alarm either when they sit up, or only when they're

LIKE A PINBALL STRIKING A BUMPER, THE ANSWER HIT HIM

Bonus: Mason plays the machine that inspired his invention

sitting on the side of the bed. It couldn't give a false alarm. It would have to self-audit, so it couldn't be secretly turned off and on. It would have to go under the mattress, not on top of it, and be invisible and imperceptible." Most importantly, it would have to work.

For two years he worked on a prototype, getting up at 5am to go to the nursing home to trial the latest version between his normal duties as maintenance man, drawing on all his electronics wizardry, trying to put the words in the right order so they meant something. Within the walls of Surry Hills Private Nursing Home there was a palpable sense that something was happening in a place where nothing much ever happens.

He saw how pressure pads had failed, so John decided his invention would need to sense heartbeat and respiratory movement. Months went by without a breakthrough. Frustrated, he went home one night and fired up Doctor Who. Suddenly – like a pinball striking a thumper bumper – the answer hit him. He knew the type of switching device he had to use. When John arrived at the nursing home the next morning he knew two more things: that conventional bed monitors would never work, and that his would. "I wasn't surprised at all," Teresa says. "No one is as clever as John. But when he finally made it, we just all thought: 'He's going to be a multi-millionaire.'"

"You have to remember," says John, "that when you move into a nursing home and you get allocated a bed, that's now your bed, for the rest of your life." It's that kind of sombre reality that framed the final design: a device tailored to one person, for one bed. Their bed.

The finished product comprises two undermattress pads, one for under the torso and a smaller one lower down that plays the key role. Because it's centred roughly under the bum, it can tell when the person has shuffled to the edge of the bed, at which point it will send an alarm to the nurses' station. This means that residents whose habit it is to sit up and lie back down repeatedly through the night before they try to leave the bed can do that without the alarm sounding, eliminating the dreaded and constant false alarms. But it can also be tailored to trigger the alarm as soon as a person sits up, if that's required.

When trials at Surry Hills Private Nursing Home proved a success, the nursing home became his first customer. John then began approaching other aged care facilities, offering free trials and struggling to keep up with demand as orders flooded in. Costs of production meant John shifted manufacture offshore to China. Needless to say, he quit soon after as maintenance man.

With so many problems solved in the quest to invent a better bed alarm, one question remains: what was the breakthrough heartbeat-detecting switching device? The pinball wizard gives a smile. "I'm not sure I want all of Australia to know," he says, only slightly apologetically.

John was definitely sure he didn't want all of China to know. He'd heard the stories of Chinese factories reverse engineering products they'd been tasked to make and was adamant it wouldn't happen with his. "I'd put so much into that device, I really didn't want it copied. There are so many little subtleties built into it, and I found that out through a lot of hard work. Why should someone just copy it when they haven't put in the work?" It's the reason one Chinese factory makes the plastic casing while another makes the rubber. A third factory makes the circuit board. None of the factories is told what they're making, or why they're making it, or that what they're making is just one component of a bigger product. When the parts arrive back in Melbourne, John and his small team connect them up. But the Bed Assist in this form will never work. The circuit board sent from China is useless. John has the only program in the world that can fix it, and it is plugged into his Melbourne computer for the final programming.

Careful as he is, John may only be able to cover his tracks for so long. His seven-year innovative patent runs out at the end of this year. When that happens, anyone will be free to rip apart his bed monitor, find his secret and do their worst. He says he's not worried. The key to success is to keep innovating. "In five years this will be a much different product. It has to be. I can't keep making the same thing or someone else will come along and make something better."

John still thinks about Roy and Cathy, who have since died. "Think about it," he says. "You've been independent your whole life. The first thing they take away is your house. The last thing to be taken away is your dignity, to go to the toilet by yourself. It's the last piece of independence you have, and you don't want anyone to help you. I've got to make this thing good, because I'm going to end up using it one day."

"John cared," says Keitha. "That was the big thing. He cared enough about these people to actually do something. And he listened to the nurses." She pauses a moment to reflect on the unfamiliarity of those last four words. "He actually listened to us."

Game over. The pinball wizard pulls the plug, the lights go out and Doctor Who sits silent as a tomb. He gives it an affectionate pat. "These old machines, they'll never come round again. I'm going to keep mine going. I've got relics from the 1930s, the first to have two levels, the first with speech, the first with electronic scoring. One day they'll all be set up in a big games room."

He looks through the glass into the darkened playfield. He knows it's about keeping the old ones going. Understanding that ageing's a bitch, and that we're all playing the same game, we're all going to be relics, and no game lasts forever. Then he turns away and gets back to work. The old pinball wizard who wants us all to keep playing just a little longer. Chasing down the bonus ball. Searching for that elusive extra life. ●