

Invention – Tzu Chi 007

Written by Tzu Chi Foundation
Thursday, 01 October 2009 00:00



Members of the Tzu Chi International Medical Association (TIMA) invented a medical and dental toolbox that can be used during free clinics. On October 1, 2009, the first day of 2009 Annual TIMA Convention, doctors set up a temporary free clinic at the convention and showcased the self-invented dental toolbox and surgical toolbox.

Invention of medical toolbox by Dr. Hong Ruey Dian

Dr. Hong Ruey Dian is an orthopedic doctor who practices in Kaoshiung, Taiwan. He brought with him a surgical toolbox to the convention, along with a rechargeable battery and small light bulb for seeing patients at nighttime or when lights are dim.

When Taiwan's 921 Earthquake happened in 1999, Dr. Hong used his golf bag as a medical tool box to see patients during free clinics. After the earthquake, Dr. Hong joined TIMA and often traveled to remote areas for free clinics. His surgical toolbox has been improved for five times; the latest idea was inspired by hydro technician's toolboxes.

The toolbox Dr. Hong uses weighs about 5kg, including surgical suture needles, bandages, a blood pressure monitor, a blood sugar monitor, various medications for emergency use, and even a small refrigerator for storing vaccines. He also carries a lot of medicine, a rechargeable battery and small headlights in his backpack so that he would be able to see patients at night or in dim light.

When Typhoon Morakot brought floods to Taiwan, Dr. Hong made regular trips to the disaster areas with his medical toolbox. As the TIMA Southern District coordinator, Dr. Hong went to the flood affected areas everyday since August 10, assessing the damages and offering free medical services. During the day he was in the disaster areas and during the night he would return to TIMA Kaohsiung branch, conducting meetings and arranging medical manpower and resources for the following day. He slept less than four hours each day. Dr. Hong said that he was able to treat most patients on-site during free clinics with this medical toolbox.

Invention of 007 dental tool box by Mr. Zhou Jin Yuan



At the temporary free clinics, TIMA still provided dental services such as tooth extraction, scaling, polishing, and filling services. This is because TIMA volunteer Zhou Jin Yuan improved portable dental tools and invented the "Tzu Chi 007 mobile dental toolbox." Currently, there are 80 sets of the toolbox around the world, and the toolbox has been used during free clinics in countries such as Taiwan, China, Singapore, Indonesia, Malaysia, Philippines, and the Dominican Republic.

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A group of dentists from free clinic in California researched and developed a “mobile dental toolbox” which could be quickly assembled and loaded into a suitcase for convenient shipment. They named the toolbox “Tzu Chi No. 3.” Later, Mr. Zhou studied and improved the toolbox for five times, and invented a portable multi-functional dental equipment toolbox. Because it looked like the agent’s suitcase from the movie “007,” it was named “Tzu Chi 007.”

At the TIMA Convention, Tzu Chi volunteers “built” a temporary clinic with curtains, showcasing the equipments in the Tzu Chi 007 dental toolbox. Mr. Zhou is a truck driver who has to repair his own truck and therefore he understands machinery. He shared his research and development process with others and said, “It used to be that when the dentists treat patients at free clinics, only the dental equipments would fill up two-thirds of the space in a car. It was even more inconvenient if they were traveling to remote islands by airplanes or boats.” Therefore, he decided to improve the equipments. He constantly consulted dentists for professional advices and cooperated with six different companies. From the first generation invented in 2001, to the fourth generation displayed today, it took him three years to come up with this new and improved invention.

Tzu Chi 007 is a suitcase, incorporating miniature version of four dental equipments: dental polishing machine, dental scaling machine, halogen lamp, and dental light. Tzu Chi 007 even makes use of a 1,250cc PET bottle as a water bottle, providing water for scaling and polishing. The dentists can simply step on the switch to start the motor and start working on patients. Tzu Chi 007 suitcase weighs 12.2kg, and is 45cm in length, 33cm in width, with less than 20cm in thickness. It is energy efficient and the size and weight is airport-friendly, and the wheels at the bottom make it easy to carry.