Super Battery-Free "HYDRAULIMB" for Hand Amputees

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Most myoelectric prosthetic hands have high dexterity but are heavy in weight due to the large number of built-in electric motors which also have limited battery lifetime. In addition they are often expensive making them unaffordable to most disabled people. On the other hand, lower end prosthetic hands have only simple griping action with limited dexterous movement. To overcome these problems, we have developed an innovative battery-free prosthetic hand , the “HYDRAULIMB” which is operated by simple hydraulic actions. It has the advantages of high-end myoelectric hands, for example, it has selectable grip patterns with dexterous finger actions. The five fingers can either bend independently or in groups giving the hand precise griping ability to pick up and release small objects like coins and screws. The wrist can rotate by up to 90° like a real hand enabling it to carry out many daily tasks like pouring water. Some of the fingers have been fitted with thermal-sensitive tips that can “feel” heat when touching hot objects. When the temperature of object is above 32°C, the color of tips will change from black to red to warn the user to be cautious. The “HYDRAULIMB” is made mostly of carbon fiber which weight around 60% less than traditional prosthetic hand and myoelectric hand. Its production cost is estimated to be less than US$150, with performance comparable to high-end myoelectric hand.

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