A Rehabilitation Aid for the Treatment of 'Clenched Fist,' Condition in Multiple Sclerosis

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Multiple Sclerosis is a progressive illness that affects the brain and spinal cord. 84% of people who have it suffer from a 'Clenched Fist'. My father has Multiple Sclerosis and I have witnessed the loss of independence caused by the condition. Market research shows no affordable rehabilitation aids available. Addressing this condition, necessitates the creation of an affordable, practical aid for independent use. This device could support rehabilitation of the muscles in the hand and forearm with further neuroplastic response improvement through visualisation. The initial prototype involved adaptation of a ‘resting splint’. This solution proved problematic by nipping the patient and incomplete opening. Further adaptations required the aid to be lightweight and strong. Consequently certain components required manufacturing using a 3-D Printer. Final modifications produced a device which included the integration of sensors, LED’s, a Microprocessor and USB Port. The rehabilitation aid was tested using designated functional tasks. The incorporation of sensors, microprocessors and USB output allowed more accurate measurement of forces associated with hand extensor movement. Downloading data from these movements facilitated statistical analysis using a T-Test, and Mann-Whitney U Test. Compared with the baseline measurements, the results showed that using the Aid significantly improved the strength and extent of manual extension. This incremental improvement was maintained over the duration of the study. The Central Nervous System has considerable recuperative powers and improvement can be enhanced using specific rehabilitation aids. This effective, affordable aid offers great potential in the restorative process in the ‘Clenched Fist’ condition in MS patients.

Awards Won:
Third Award of $1,000