

A "MODIFICATION" OF A RECIPROCAL WRIST EXTENSION FINGER FLEXION ORTHOSIS

By THORKILD J. ENGEN, C.O.

Director of the Orthotic Department,
Texas Institute for Rehabilitation and Research, Houston, Texas

Patients afflicted with spinal cord lesions or injuries of the C-7 level often lose the activity of intrinsic hand muscles and the long flexor muscles acting about the wrist. When wrist extensor muscles with good strength are available, the patient often can get useful prehension of the first and second digits against the opposed thumb. Functional application of a modification of the Bisgrove type reciprocal wrist extension finger orthosis¹ can be used for this purpose. This device will provide flexion of the fingers at the metacarpophalangeal joint when the wrist is extended from a partially flexed position. The degree of digital flexion power obtained is dependent upon residual extension strength.

Blue prints and pictures in Figures 1-6 give a detailed view of the parts of the device, their assembly and application. Figure 1 shows a schematic perspective of the orthosis. Figure 2 shows the parts to scale with representative measurements for application to an adult. These measurements must be individualized. Some modification of the orthosis may be required with each application; for example, it is necessary to stabilize the thumb in opposition to the fingers with a crutch if the patient does not have an opponens muscle function.

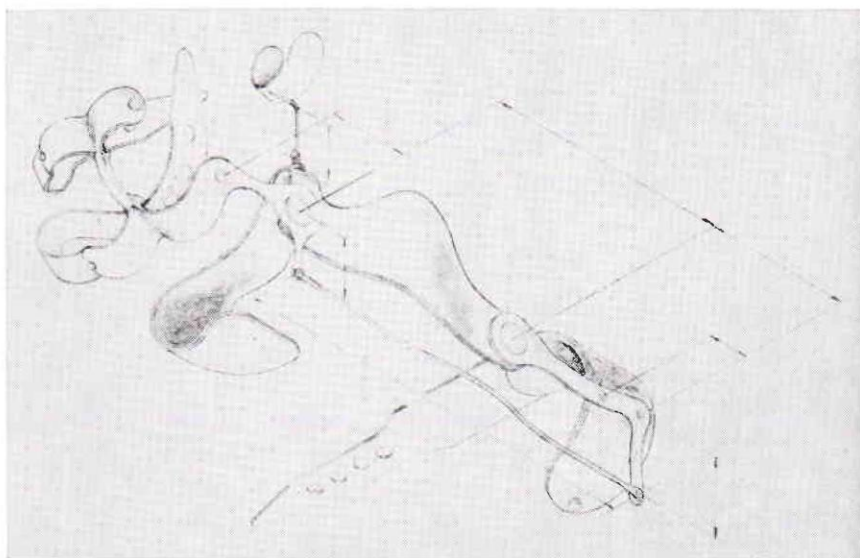


Fig. 1—Reciprocal wrist extension; Finger Flexion Orthosis.

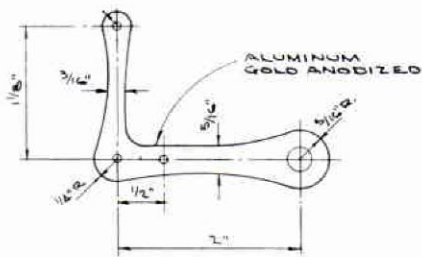


Fig. 2A—Hinge Detail

Fig. 2—Parts List: Reciprocal Wrist Extension Orthosis. Parts A-1. Note all parts made of 072-24 S. T. Aluminum unless otherwise shown. All measurements are for the viewer to gain a size perspective only.

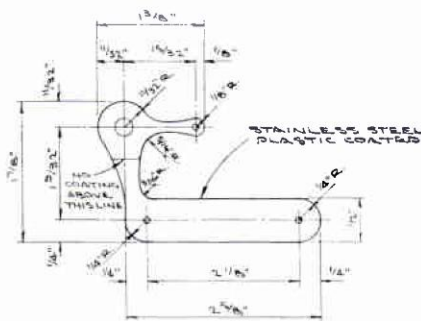


Fig. 2C—Finger Tip Piece Detail

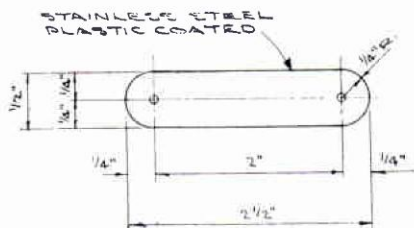


Fig. 2B—Finger Tip Detail

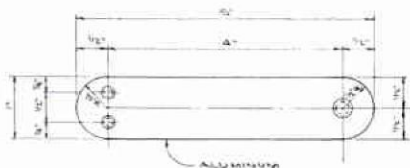


Fig. 2E—Wrist Band Detail

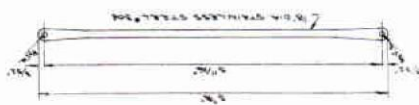


Fig. 2F—Control Bar

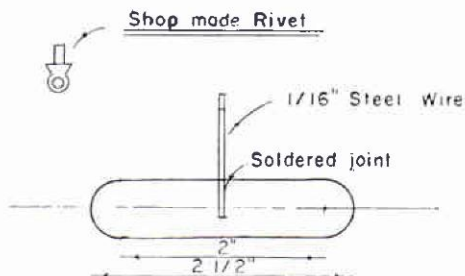


Fig. 2H—Thumb Piece Detail

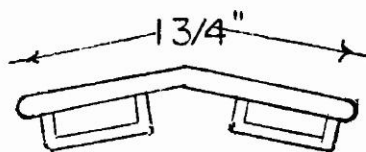


Fig. 2I—Finger Extension Holder

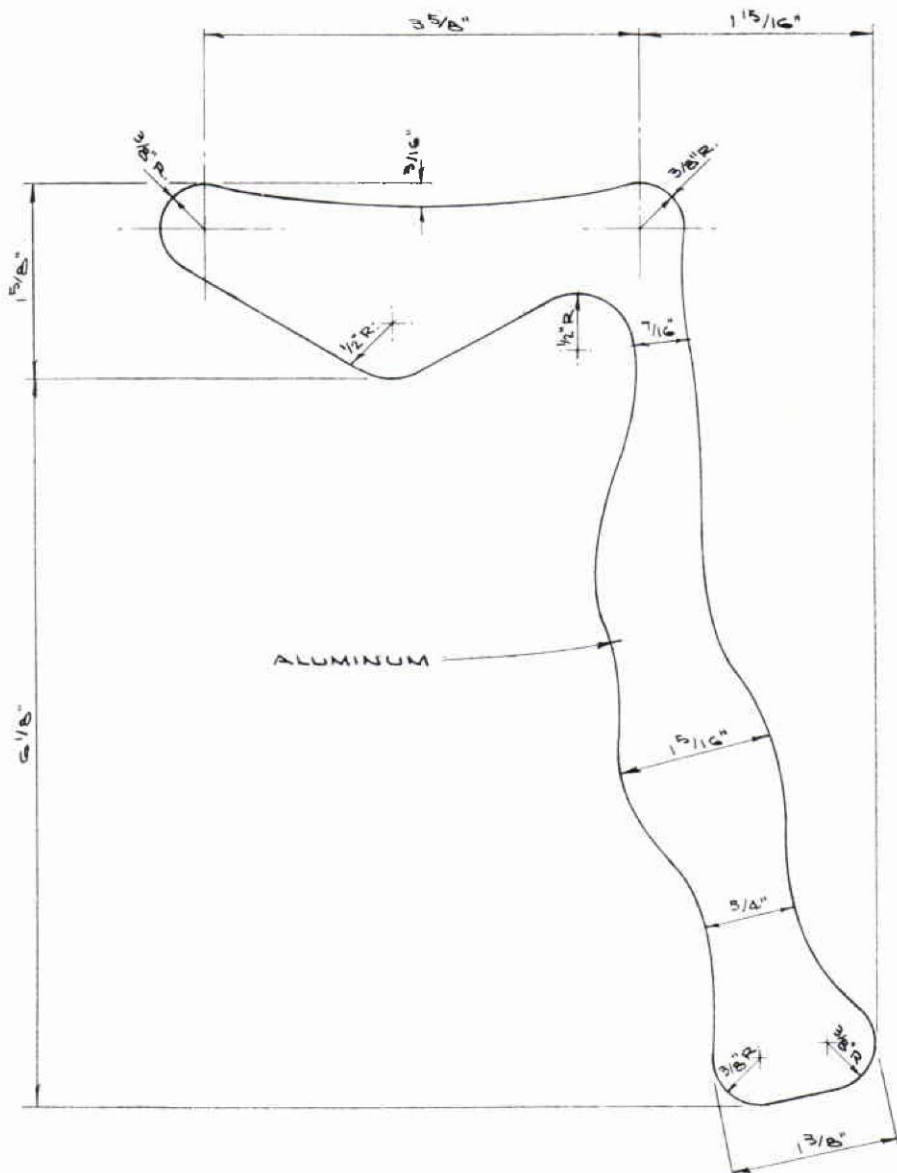


Fig. 2G—Hand Piece Detail

Figure 3 shows the configuration of a typical patient's hand so that the prominence of the extensor carpi radialis can be visualized. Figure 4 demonstrates prehension when the wrist is extended. Figure 5 shows over-all grasp when the wrist is in a flexed position. Figure 6 demonstrates the orthosis in actual use by a patient.

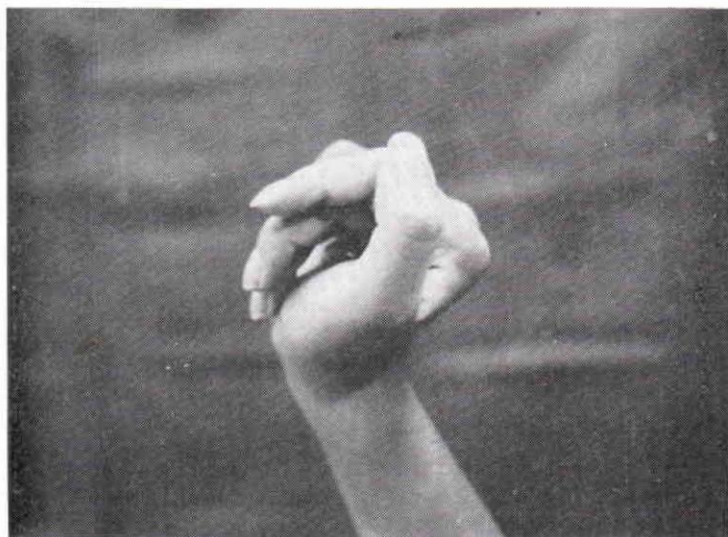


Fig. 3

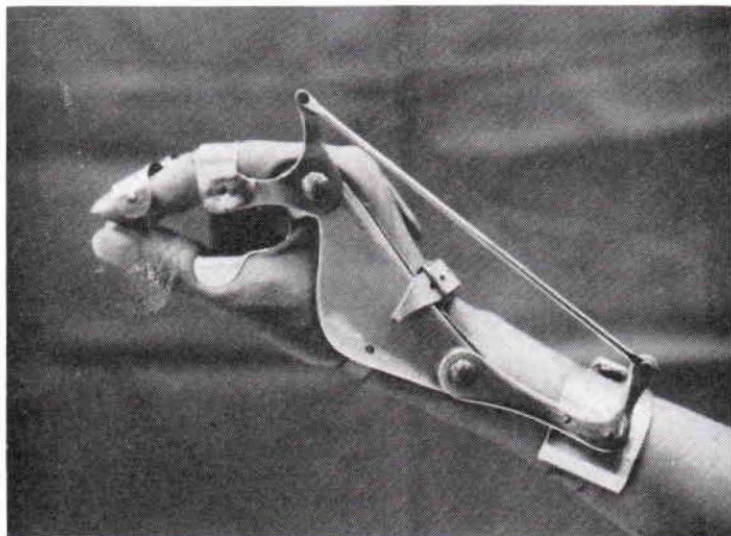


Fig. 4

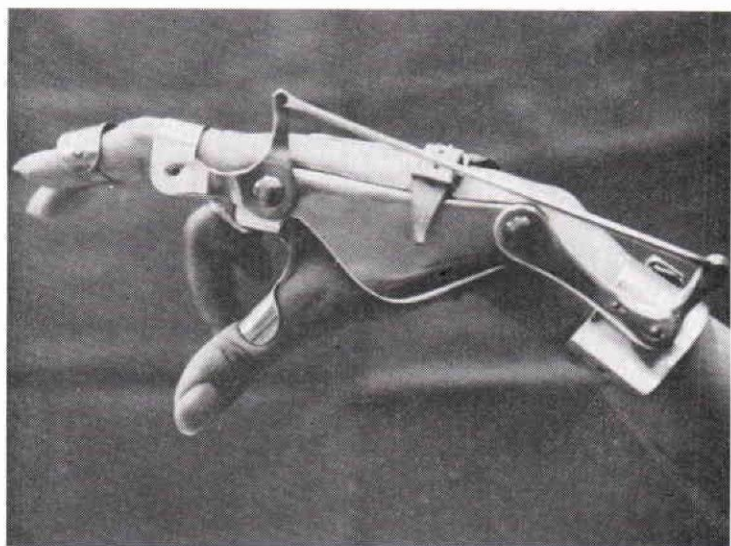


Fig. 5

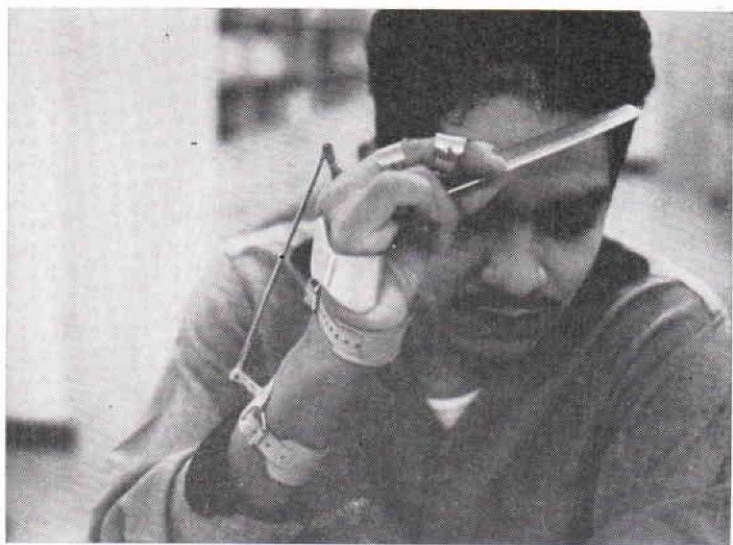


Fig. 6

