ADULT CENTER CONTROL HOOK [a]

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INTRODUCTION

The design of an adult center control hook and the results of field testing the device on two amputees are covered in the following.

A center control hook is simply a hook whose control cable passes through the axis of the mounting stud. The advantages of this device over the conventional hook are its ability to be rotated or flexed at the wrist without a change in control cable excursion and the location of the control cable inside the forearm where it is not a hazard to clothing.

The VA Prosthetics Center is currently producing a limited number of these hooks for testing at other research centers in order to expand the evaluation program.

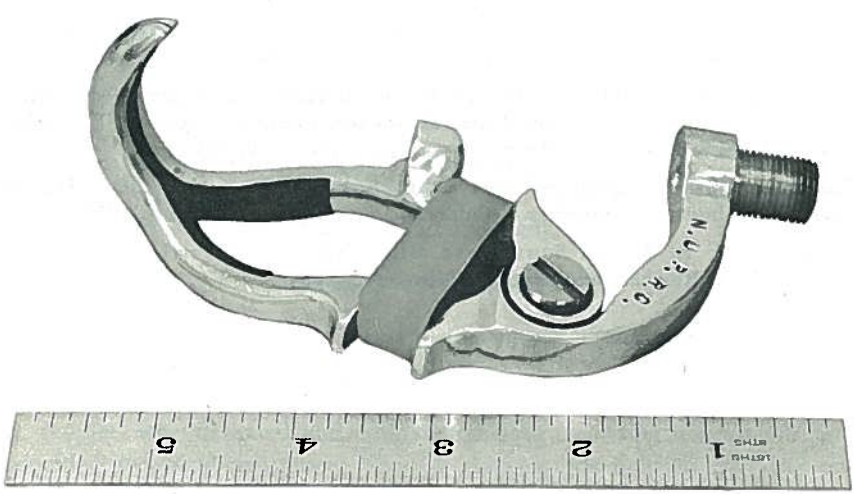

FIGURE 1

[a] Based on work performed under VA Contract V1005M–1079.

DESIGN

The prototype model was constructed by saw cutting the shape from 7075–T6 aluminum alloy, then filing and polishing to the final shape. Black neoprene rubber 1/16 in. thick was bonded to the gripping surfaces using 3M adhesive EC–1300 (Fig. 1 and 2). The pivot contains a stainless steel screw and two ball thrust bearings to minimize friction with one set having races of concave cross section to maintain alignment. This is the same pivot system used in the Dorrance aluminum hooks. To allow the cable to pass through the center of the mounting stud, the pivot is offset 1 5/8 in. from the stud centerline. The tip of the hook fingers are set on the stud centerline, giving a radial deviation of approximately 25 deg. This allows the patient to approach an object with the hook in much the same manner as a normal hand (Fig. 3). The overall length is the same as the Dorrance #555 hook; however, for a given number of rubber bands, the force at the hook tips is approximately 10 percent greater due to the shorter distance from the hook tips to the pivot.

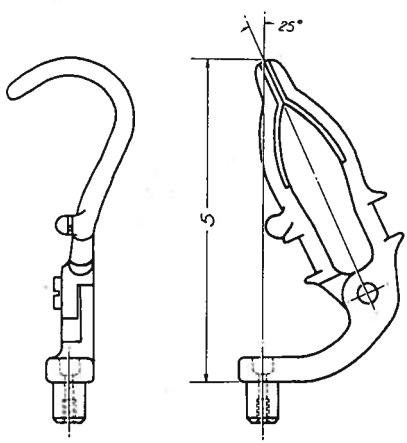

FIGURE 2

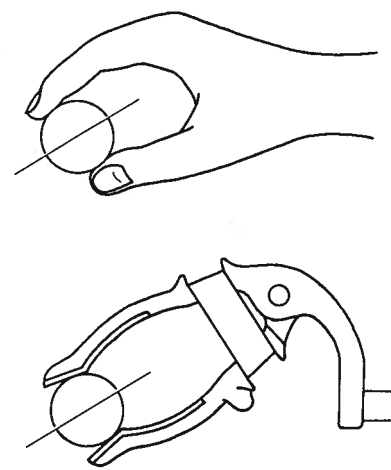

FIGURE 3

CASE HISTORIES

Case No. 1. F. L., a male right above-elbow amputee with a 9-in. stump, whose occupation requires only desk work, has been an active prosthesis wearer for over 20 years. The experimental hook was used for both business and social gatherings; he used no other terminal device during the 10-week test period. His initial reaction to the shape was a bit disconcerting because of its "lopsided feeling" as compared to his previous hook (Dorrance #555), however, within a few days this "feeling" disappeared. He

liked the ability of the hook to be easily rotated 360 deg. without change of cable excursion, and the absence of wear on shirt cuffs caused by a control cable. He felt that the absence of a "thumb" in no way detracted from its usefulness. He was very reluctant to surrender the hook and expressed a desire to wear one on a permanent basis.

Case No. 2. S.M., a male, right above-elbow amputee, is an active prosthetic wearer. He is employed by a hospital where his occupation requires desk work plus light manual labor. The experimental hook was the only terminal device used for the 9-week test period. He was very conscious of the "different" shape for a period of approximately four weeks, but felt that other people were unaware of this change in his terminal device. He liked the ability of the hook to be rotated without a change in cable excursion, and the inward slant of the fingers. He felt a thumb would be helpful, but not essential. The subject was reluctant to change back to his previous terminal device (Dorrance #555) and very anxious to obtain a center control hook if it were commercially available.