Power Steering for the Mono Drive*

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The mono drive unit has become a popular method for applying power to standard Everest and Jennings wheel chairs. Manual steering capability is the chief limiting factor for patients with upper extremity involvements. Paralyzed patients requiring wheel chairs have varying degrees of involvement and will select the most economical chair they can control at the time. If their selection is a mono drive unit which they are capable of controlling as it is or with assistive devices, progressive upper extremity involvement would necessitate rebuilding the chair or buying a new one. Since this problem has actually occurred at Rancho Los Amigos Hospital, and repetitions appear probable, there seemed to be a valid need for a powered mono drive steering unit.

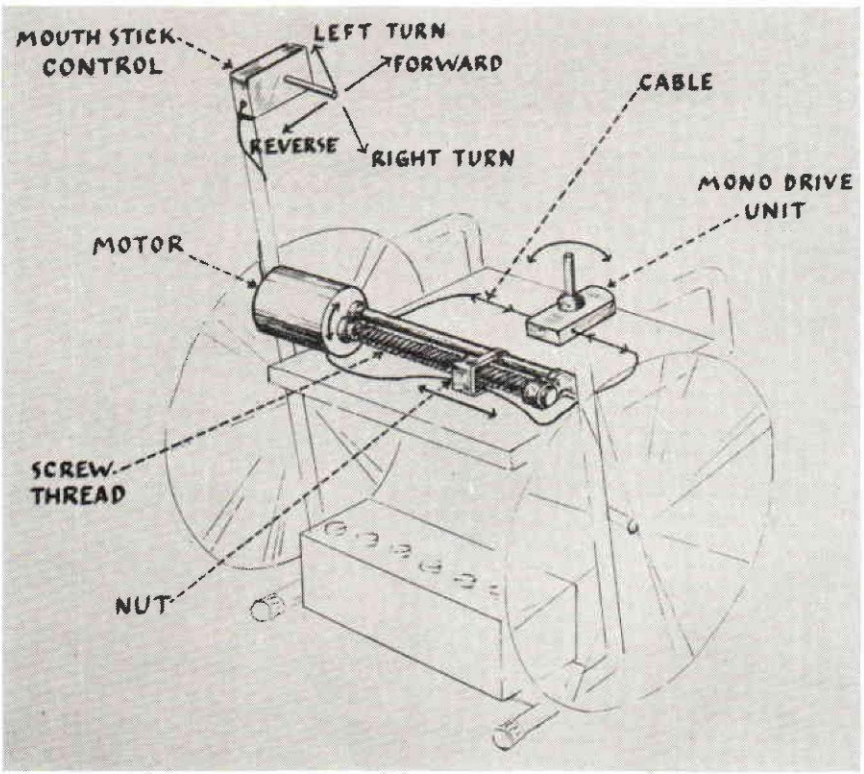

Figure 1

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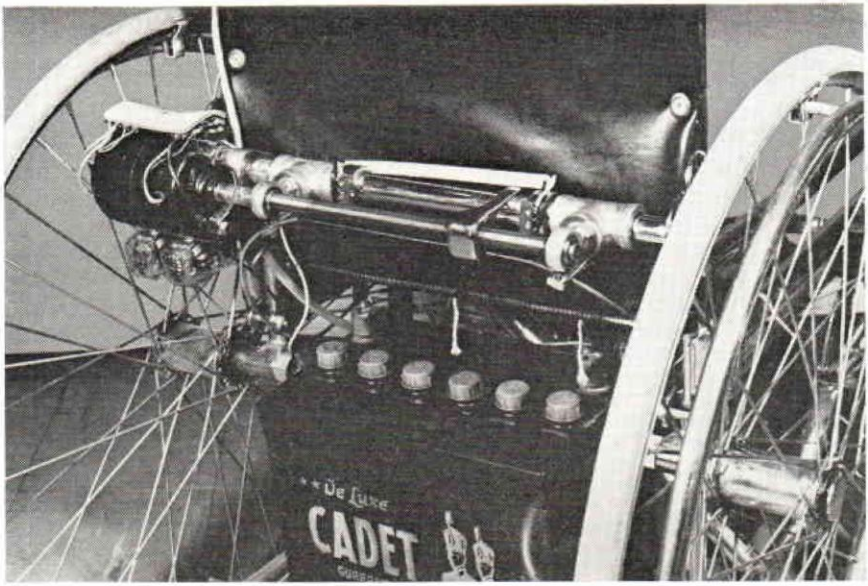

Figure 2

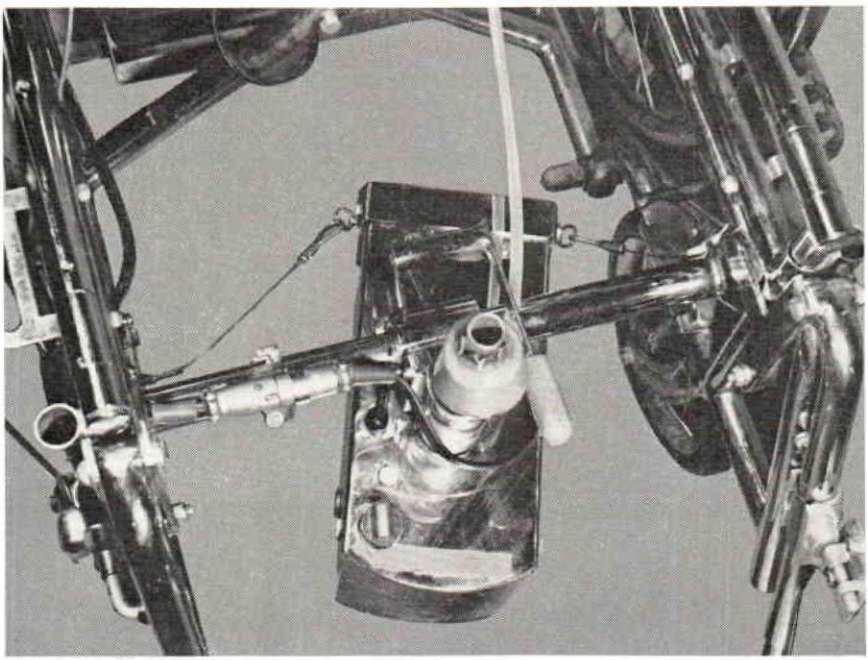

Figure 3

The unit which was developed is shown diagrammatically and pictorially in Figures 1 and 2 installed on the back of the chair. This mounting position is necessary on junior chairs. On adult chairs it can be mounted more conveniently under the seat. Two standard mounting brackets, with a round cross-bar, hold the entire unit in place. Rotary action of the 12 volt D.C. motor is converted mechanically into a linear motion by the screw thread.

Standard prosthetic cable is attached to the nut, then led through a housing and attached to a bracket which fits over the mono drive unit which is shown in Figure 3. Since the cable connection is a closed loop, bidirectional motion of the nut rotates the mono drive in either direction. A distinct advantage of the cable linkage is that it allows the mono drive unit to be retracted on the standard wheel chair.

The control system which works best is of a joystick type action and is illustrated in Figure 4. The horizontal forward and backward motions control the wheel chair mobility, while the vertical up and down action steers the mono drive. The additional short handle is a toggle switch which gives the low and high mobility drives. This control unit provides simultaneous or separate mobility and steering. Figure 5 is the schematic of the power unit control.

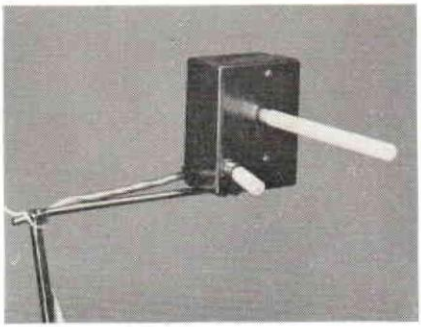

Figure 4

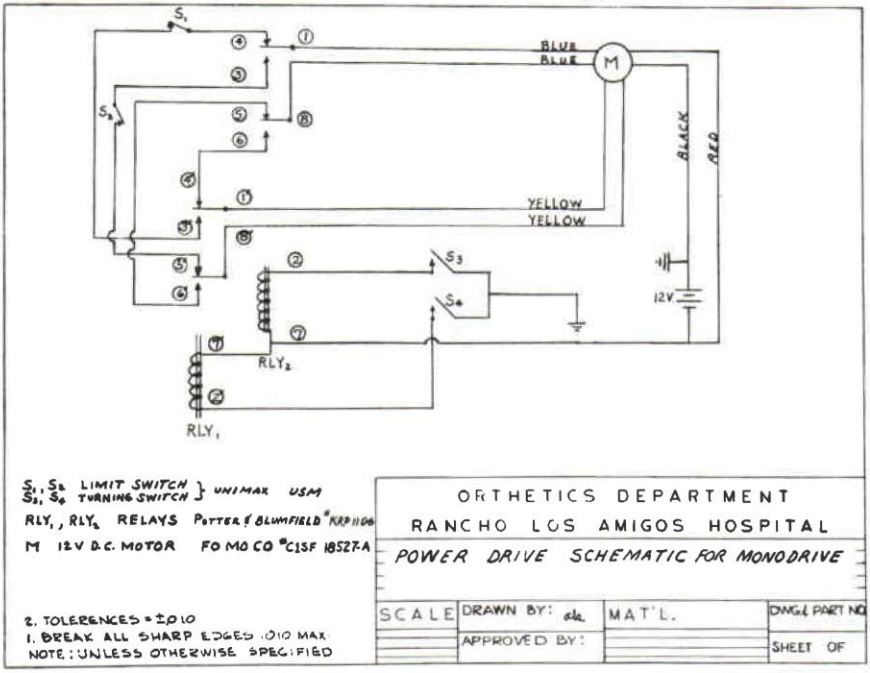

Figure 5