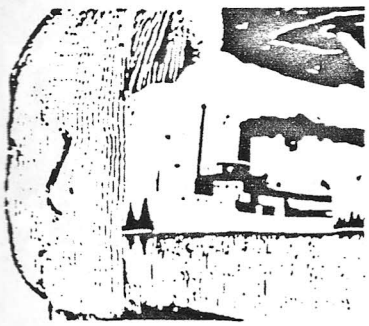

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# AN INSTRUMENTED GLOVE FOR TETRAPLEGICS

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**[Introduction]** A NMES based rehabilitation programme towards restoring upper limb movements depends on closed loop control performance, which has been limited by sensor development for practical daily use (Cliquet Jr., A. et al., Rehab. Eng. Soc. N. Am., 12:29-31, 1992; Sepulveda, F. & Cliquet Jr., A., Artif. Organs., 19(3):231-237, 1995). This work suggests a glove design with FSRs to supply force feedback.

**[Materials and Methods]** The system is composed by a lycra commercial glove with FSRs attached to the distal phalanges of the thumb, index and long fingers. After amplification and filtering, the signal is digitalized through an A/D converter and visualized graphically through C language based software.

**[Results]** In order to calibrate the system, the sensors were submitted to static tests where force ranged from 0 to 1500gf. The coefficients of the equations (polinomial fitting of 7th order) for the characteristic curves shown in figure 1 were inserted in the software, enabling the read out of forces directly, during object manipulation. The system was applied to normal subjects aiming at getting to know the behaviour of grasping. Figure 2 illustrates the forces applied to grasp a cylindrical object (500 g).

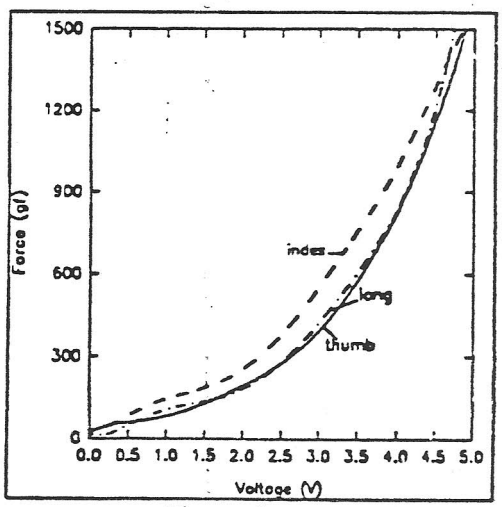


Figure 1

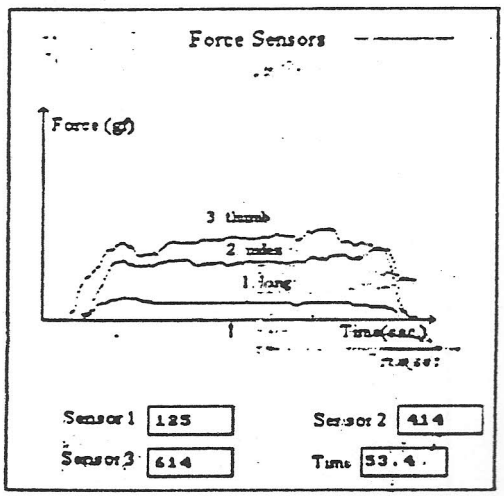


Figure 2

**[Conclusion]** The system did show efficiency being able to indicate grasp forces during object manipulation. Furthermore it is an easy system to use and cosmetically acceptable, thus being appropriate for practical daily use.

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