SHOULDER VIBRATIONS INDUCED BY PROSTHESIS' MOTORS

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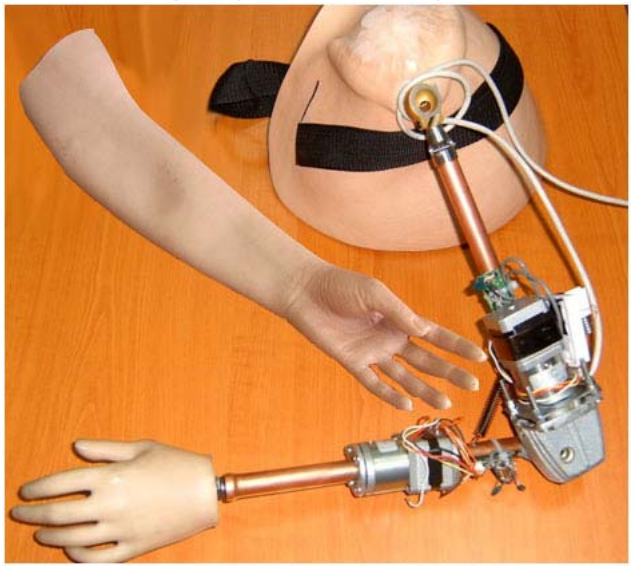
Upon the completion of a prosthesis prototype, a vibration analysis was fulfilled in order to investigate the amplitudes in some ordinary tasks, to evaluate and improve the mechanical behavior of the prosthesis, by modifying the command parameters of the motors. The readings were performed to determine the prosthesis' impact on the wearer's shoulder from a mechanical point of view. A set of measurements have been done on the prosthesis and the harness to establish the vibration levels, comparing them with the admissible values from the EU and Romanian normative.

Human vibration is defined as the effect of mechanical vibration in the environment on the human body. Taking into account the effect of vibrations on the body, it is especially important that these are measured, known and beneficially employed (training, rehabilitation, treatment, etc.) or eliminated (diminished). Regarding prostheses, due to their transmissions elements, motors and reducers, vibrations are formed throughout the system, vibrations that can lead to a faulty functioning of the assembly and even at an discomfort of the wearer. For this reason, it is necessary a vibration study of the (axial) vibrations, a study that grows in importance due to present tendencies in making superior performance assemblies, with higher speeds and high dynamic stability. A common problem associated with many motion and power transmission systems is the resulting noise and vibration that prevails when all of the components are linked together. Alone, the various components that make up the system pose no noise or vibration problems. Once these components are integrated into the final product, however, their individual dynamic characteristics can interact, resulting in a wide range of vibration related problems.



The measurements were performed on the prosthesis from accompanying figure, designed in the framework of a PhD thesis.

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