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## TRB1959 - A SYSTEM FOR MECHANIZED KNEE FLEXION IN LOWER LIMB ORTHOSIS

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*Abstract:* This article describes the design, construction and test of a mechanical device that can be coupled to knee-ankle-foot orthosis (KAFO) to provide knee flexion in the swing phase of the gait through the action of a torsional spring. A prototype was built and tests were conducted with a T12 paraplegic patient at AACD (Associação de Assistência a Criança Defeituosa). A substantial improvement on aesthetics and step length of the swing phase was verified during the tests.

*Keywords:* knee flexion, "powered" dynamic gait.

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## TRB2006 - A STRAIN-GAUGED FORCE PLATFORM FOR LONG JUMP APPLICATIONS

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*Abstract:* A first numerical approximation for design of a strain-gauged force-platform for long jump takeoff applications is presented. The strain gage sensors were strategically placed over a metallic structure that supports a composite material cover for the athlete foot contact. The basic limitations in design are because the loads applied to force platform are dynamic in nature, in a way that the natural frequency must be greater than the excited contents of frequencies. This high frequency requirement lead a light and rigid structure, but the principle of force measurements with strain-gauge-actuated transducers consists of placing a strain-gauge-instrumented elastic member in series with the force to be measured, which must to support elastic deformation. This lead a stiffness reduction of this members. In the other hand, transducer sensitivity is inversely related to stiffness. The developed force-platform is able for measurements of the action force about his contact surface and the respective torque, allowing the three orthogonal forces components determination ( $F_x$ ,  $F_y$ ,  $F_z$ ) and the torque around the three orthogonal axes ( $M_x$ ,  $M_y$ ,  $M_z$ ). According its dimensions, this platform will be able to substitute the authentic wooden board used in long jump training.

*Keywords:* biomechanics of sports, long jump.