Leg extension

to reinforce the muscles of the lower limb.

The stress which the ligaments undergo during exercises to the leg extension can be schematised by comparing the leg to a beam (fig. 1).

When the whole structure is still, balance is ensured by the contrast of the load applied (P) and the force (F) generated by the quadriceps muscle (fig.1-A, B).

During movement, on the other hand, rebound phenomena are produced. When the leg is stretched to the full, the point of insertion of the quadriceps becomes the fulcrum around which the foot tends to rise, drawn by inertia, making the head of the tibia fall on the opposite side, and causing severe distress to the posterior cruciate ligament (fig.1-C).

When the load loses its kinetic energy and begins to weigh on the leg again, it creates a moment of force that is inverse to the preceding one and is discharged mainly on the anterior cruciate ligament (fig.1-D).

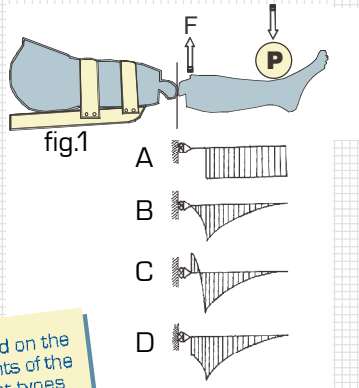

fig.1

To avoid this stress, particularly in cases of trauma, it is advisable to put the leg in a sling and make it solid with the load arm so that the rebounds are discharged onto the frame of the machine.

However, if the arm uses a "non-physiological" articulated joint, the latter imposes its motion, drawing the knee on its trajectory and creating traction and compression tensions on the cruciate ligaments and the other damaged articular structures.

See: TECHNICAL DATA Tensions induced on the cruciate ligaments of the knee by different types of articulated joints.

The articulated KTJ – Knee Top Joint® mounted on the leg extension makes the bending-stretching trajectory of the load arm of the machine coincide with the rotor-translatory motion of the knee and prevents rebound tensions (leg not constrained to the mechanical arm), traction and compression tensions (leg secured to the machine) from discharging onto the articular segments (ligaments, meniscus, capsule, cartilages) and thus damaging them.