GYM BARBELL JACK FOR CHANGING DISCS DURING STRENGTH TRAINING

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RESUM

The ***Health, Physical Activity and Sports Technology (HEALTH-TECH)*** research group at the University of Alicante has developed a **new weight bar lifting device for gyms**. By applying the principle of a second-class lever, this device makes it easier to load and unload weights without the user having to lift the bar manually from the floor. Consequently, during strength training, this would help to avoid the risk of lower back injuries, reduce the time needed to change discs and improve safety regardless of the user's characteristics, the magnitude of the load or the environmental conditions.

The researchers are seeking **fitness equipment manufacturers** interested in exploiting and marketing the device through licensing agreements.

AVANTATGES I ASPECTES INNOVADORS

MAIN ADVANTAGES OF THE TECHNOLOGY

The main advantages of this technology are as follows:

- It eliminates the need to apply manual lifting force and replaces positions involving lumbar flexion with a biomechanically **neutral upright posture, thereby eliminating the risk of injuries** such as herniated discs, disc protrusions, ligament injuries and chronic lower back pain.
- It **increases user safety**; for example, it **eliminates** the **risk** of **suddenly losing control** of the bar when, under conditions of fatigue, high weights are lifted. This prevents the risk of impact with the floor, damage to equipment or crush injuries to the lower limbs.
- It improves **efficiency** by reducing the **time** spent changing discs by more than 50%. Typically, this can take between thirty and ninety seconds per end of the bar; in a session involving multiple load changes, the cumulative time can amount to between five and twelve minutes of non-productive auxiliary work.

INNOVATIVE ASPECTS

Unlike other commercial devices, the present invention **maximises the mechanical advantage** through a specific geometric configuration in which the length of the power arm is significantly greater than the length of the resistance arm. Thus, the structure is configured to rotate about a dynamic pivot point fixed to the main column of the invention. This feature ensures that, during operation, the stability of the assembly's centre of gravity is maintained throughout the entire movement, thanks to its width.

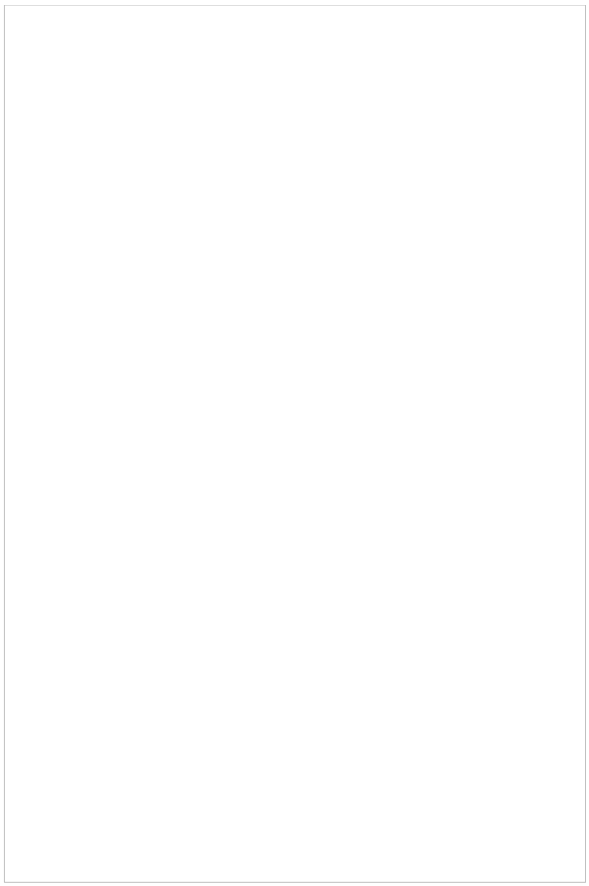


Figure 2: View of the device in use

APLICACIONS DE L'OFERTA

It is primarily aimed at the **personal training and fitness sector**, including gyms, training boxes, high-performance centres and home settings, where heavy weights are frequently used and compatibility with different types of bars and discs is required.

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We are seeking fitness equipment manufacturers interested in exploiting and marketing the device through **licensing agreements**.