Flexor Tendon Imaging Apparatus

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ABSTRACT

Researchers at the University of California, Davis have developed a portable apparatus that standardizes digit positioning and applies counter-resistance for improved imaging of the flexor tendon system in the hand.

FULL DESCRIPTION

This invention features a low-profile, easy-to-use device designed to hold a patient's digit in precise joint angles (MCP at 0° extension, PIP at 40° flexion, DIP at 10° flexion) during flexor tendon imaging. By ensuring standardized positioning without continuous measurement, the apparatus enhances reproducibility and validity. It includes a calibrated spring mechanism that applies counter-resistance to the digit tip, accentuating tendon bowstringing in ultrasound imaging. The device has the potential to improve patient and examiner ease while maintaining consistent tension and positioning across imaging sessions.

APPLICATIONS

- Ultrasound imaging of flexor tendons in clinical and research settings.
- Diagnostic tools for hand tendon injuries and pathologies.
- Physical therapy and rehabilitation assessment devices.
- Orthopedic and hand surgery preoperative and postoperative evaluation.
- Medical device market for musculoskeletal imaging accessories.
- Telemedicine and remote diagnostic facilitation with standardized imaging.

FEATURES/BENEFITS

- Standardizes joint angles for reproducible and valid tendon imaging.
- Incorporates native counter-resistance mechanism to highlight tendon tension.
- Low-profile and portable design suitable for ultrasound transducer use.
- Eliminates need for complex patient instruction or repeated measurements.
- Adjustable tension with potential to integrate real-time force feedback sensors.
- Reduces variability in patient hand positioning during imaging studies.
- Improves reproducibility and validity over traditional goniometer-based methods.
- Overcomes challenges of patient mobility and compliance during positioning.
- Enhances visualization of flexor tendon bowstringing under tension.
- Minimizes examiner-dependent variability and measurement error.

PATENT STATUS

Patent Pending

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OTHER INFORMATION

KEYWORDS

bowstringing, counter-resistance, digit positioning, flexor tendon, imaging apparatus, joint angle standardization, portable device, tendon imaging, ultrasound compatible

CATEGORIZED AS

- **Engineering**
  - Engineering
- **Medical**
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