

Novel Vertebral Attachment Device

ID: 2015-004

Executive Statement:

A revolutionary compliant mechanism clamp designed to offer a secure, adaptable, and minimally invasive attachment to spinal vertebrae.

Technology Overview:

This innovative vertebral attachment device addresses the limitations of traditional spinal fixation methods by utilizing a compliant mechanism clamp. It is designed to accommodate the complex shapes and sizes of spinal vertebrae, ensuring a secure fit with minimal bone and soft tissue damage. Unlike permanent fixtures like pedicle screws and cement, this device features needle-like structures for cortical bone penetration, providing high resistance to bending and allowing for easy, non-destructive removal. The device can be crafted from various materials to suit specific application needs, including stainless steel, titanium, bioabsorbable polymers, and nitinol.

Key Advantages:

- Minimally invasive with reduced bone and soft tissue damage
- Reusability and easy revision without excessive damage
- Adaptable design for a secure fit across different vertebral sizes and shapes
- Material versatility to meet diverse application requirements
- Eliminates thermal reactions and mechanical failures associated with traditional fixation methods

Problems Addressed:

- Damage to bone and soft tissues by permanent fixation methods
- Complications from exothermic reactions and mechanical failures in bone quality
- Limitations in securing attachments to vertebrae of varying shapes and sizes
- Challenges in revising or removing traditional spinal fixation devices

Market Applications:

- Spinal surgery and fixation procedures
- Biomechanical testing and research
- Medical device innovation and development