

# PIPE MEDICAL ENGINEERING

## DENTAL MEDICINE - ORTHODONTICS

### **Magnetic chain for re- tainer positioning (MM-1075-UMG)**

The present invention facilitates fast, cost-effective positioning of retainers and/or other dental-medical devices. Several permanent magnets are positioned side-by-side into a non-magnetic network to form a flexible chain. In order to position a retainer on the lingual side, a flexible magnetic chain is fixed onto the vestibular side of the teeth by application of commercial damming wax. Due to the magnetic force located on the lingual side, the retainer wire is drawn towards the side of the teeth and can effortlessly be aligned and precisely positioned. Further adhesives fixation is performed according to standard procedures (e.g., retainer adhesion with liquid composite resin).

**IP Holder:** Georg-August-University Göttingen/Germany

**Status:** German patent pending (DE 10 2007 033 826 A1).

### **Novel orthodontic bracket (ZEE20011211)**

Arising pain and pressure sensation due to torsion forces during orthodontic treatment are usually gauged by the attending dentist with consideration of a patient's inherent pain tolerance.

By means of a bracket-integrated capacitive sensor unit, emerging forces can be determined in a fast and effective way. Measured values are determined via a counter-contact at the bracket, or contactless with assistance of a special orthodontic instrument. By means of data variation, necessary readjustments can be deduced, which results in precise, cost-effective and non-traumatic treatment.

**IP-Holder:** Albert-Ludwigs-University Freiburg/Germany

**Status:** European Patent issued, EP 1505921, validated in Fr, De, CH, BE, GB, IT, NL, AT

## DENTISTRY - PROSTHETICS

***Procedure for production of mechanically stable, fully-ceramic pivot teeth with graded porous transition, resulting in bone in-growth***  
(2006/4)

Using this novel manufacturing procedure, ceramic dental implants consisting of Zinc- or Aluminum oxide can be produced by means of electrophoretic deposition (ED) followed by a sintering process. The ED procedure results in homogenous pore size and density distribution, which significantly reduces cost-intensive final implant processing. Additionally, a subsequent fritting procedure in sections of the dummy mould results in pivot tooth formation, which consists of compact ceramic in the head section/inner part and is porous on the outside layer. Consequently, a refined, graded, and porous transition between bone and the compact pivot tooth is created. This facilitates bone in-growth to form a solid network with the jaw, resulting in mechanical stability and ultimate strength.

**IP-Holder:** Saarland University/Germany

**Status:** Patent granted: DE 10 2006 036 663 B3  
European patent pending (EP1884577).

***Measuring device and procedure for customary dimensioning of dental bridges***  
(2007/14)

Dimensioning of ceramic bridges takes place according to standard procedures, although masticatory forces vary between patients. Accordingly, dental bridges are often over- or under-dimensioned and patients suffer from aesthetic or paradontal hygiene impairments. This novel device provides a patient-specific dimensioning of full-ceramic bridges, especially in the bridge framework area. The maximal chewing force of a patient's pillar teeth is determined by means of this novel small device, which is able to precisely measure acting forces in the last molar area, leading to a customary dimensioning of bridges. In contrast to existing procedures, no excessive irritation of the mouth corner is observed.

**IP-Holder:** Saarland University/Germany

**Status:** Patent pending (DE 10 207 024 479 A1).

## DENTISTRY – ORAL SURGERY

### ***Vibration-diminished hand-held instrument (07082HPV/CHA)***

Medical hand-held instruments, in particular orthodontic tools e.g., angled hand pieces, dental grinding and polishing tools, produce mechanical vibrations while in operation. The tool described here reduces these unwanted side effects by diminishing vibrations. Left out cavities inside the tool are filled with granular particles, which transfer energy of mechanically-oscillating particles into heat energy and low frequency signals. This results in attenuated vibrations, easier instrument handling and increased patient comfort.

**IP-Holder:** Charité - Universitätsmedizin Berlin/Germany

**Status:** German and international patents pending (DE 10 207 052 539 A1)

### ***Technical osteosynthesis aid to monitor fracture healing (ZEE20050713)***

This innovation facilitates the gathering of mechanical stress data of implanted osteosynthesis plates and the determination of retention forces between orthodontic attachments (osteosynthesis screws) and bone.

The measuring device consists of capacitive sensors which are placed between osteosynthesis plate and bone, or between osteosynthesis plate and orthodontic attachments. Each sensor is a part of an LC-resonance circuit and is read-out by means of a wireless electromagnetic field. As a result, the healing process of a fractured bone can be monitored and post-operative complications or implant loosening can be avoided or corrected early.

**IP-Holder:** Albert-Ludwigs-University Freiburg/Germany

**Status:** European patents pending (EP1926445).

Ansprechpartner:  
Dr. Harald App, Dr. Kathrin Lauckner  
Stefan-Meier-Straße 8, 79104 Freiburg  
Tel: +49 (0)761/2 03-50 17  
E-Mail: harald.app@zft.uni-freiburg.de,  
kathrin.lauckner@campus-technologies.de