Computer-Guided Orthodontic Tools for Optimal and Efficient Placement of Braces

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Technology description

Positioning Device and Tracking Sensors Make Orthodontic Bracket Placement Precise, Efficient, and More Comfortable for Patients

This computer-guided bracket positioning device and indexing tool employs tracking sensors for more precise, efficient, and effective orthodontic bracket placement. In the United States alone, more than 4 million people wear braces. These patients invest thousands of dollars into orthodontic procedures to align their smiles and prevent complications due to crooked teeth or misaligned jaws. Brackets are the most important element and bracket placement the most important procedural element of orthodontic treatment. Available orthodontic procedures are labor intensive, time consuming, and operator dependent and not reliably accurate. Patients require approximately 28 brackets for a full set of braces; each bracket plays a role in rotating and aligning teeth and jaw. Researchers at the University of Florida have developed a computer-guided bracket positioning device and indexing tool with tracking sensors to guide bracket placement. Using these tools, an orthodontist or assistant can effectively plan bracket placement on a virtual or physical model of a patient's teeth, and then use sensors in a bracket-positioning tool to place individual brackets precisely in their planned optimal position.

Technology

This computer-guided bracket positioning device and indexing tool with tracking sensors enables precise planning and application of orthodontic brackets. An assistant would use a bracket positioning tool and an indexing tool to fit brackets onto a physical or virtual model of a patient's teeth. (The patient does not need to be present.) The assistant saves these bracket placement coordinates (with six degrees of freedom) on a corresponding model within the computing system. During the actual bracket placement, an orthodontist or assistant would apply each bracket individually using the predetermined coordinates with computer guidance and sensor feedback. The sensors indicate (via audio, visual, or haptic feedback) when each bracket is precisely in the preplanned installation position, enhancing precision, efficiency and reliability of orthodontic brace bracket application procedures.

Application area

Reliable treatment plan and placement of orthodontic braces

Advantages

Uses audio, visual, or haptic feedback, signaling when the bracket applicator matches the planned bracket placement position

Makes bracket application precise, reducing bracket placement and treatment time (i.e. total time in braces)

Uses a computer-guided program and virtual or physical models for planning, enabling more reliable precision during the planning and placement stages

Institution

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