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Vu et al.

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(54) **METHOD FOR PRODUCING AT LEAST ONE PATIENT-SPECIFIC MODULARLY COMPOSED BRACKET BODY AND CORRESPONDING BRACKET**

USPC 433/2-24
See application file for complete search history.

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CPC *A61C 7/14* (2013.01); *A61C 7/002* (2013.01); *A61C 13/0004* (2013.01); *Y10T 29/49568* (2015.01)

(58) **Field of Classification Search**
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(56) **References Cited**

U.S. PATENT DOCUMENTS

2,701,913 A * 2/1955 Lane 433/16
4,165,561 A * 8/1979 Miller et al. 433/9
(Continued)

FOREIGN PATENT DOCUMENTS

EP 0 502 227 11/1996
EP 1 844 730 10/2007
(Continued)

OTHER PUBLICATIONS

International Preliminary Report on Patentability and Written Opinion, Aug. 22, 2013, Hoang Viet-Ha Julius Vu.

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(57) **ABSTRACT**

A method for producing a patient-specific modular bracket having a pad and a bracket body. A bracket body library of bracket bodies includes bodies that are formed from a raw bracket body having a spacer section. A first parameter is established for cutting through the spacer section from a slot of the bracket body to set a height of the bracket body. A second parameter is established for cutting through the spacer section at an angle to a mesio-distal axis of the bracket body to set a torque value of the bracket body. A third parameter is established for cutting through the spacer section at an angle to an occlusal-gingival axis to set a rotation value of the bracket body. The spacer section is cut through according to the first, second and third parameters. Patient specific set-ups are then created by selecting and attaching pads from a raw pad library.

17 Claims, 14 Drawing Sheets

