



US007510052B2

(12) **United States Patent**
Ayle

(10) **Patent No.:** **US 7,510,052 B2**
(45) **Date of Patent:** **Mar. 31, 2009**

(54) **ACOUSTIC SEPTUM CAP HONEYCOMB**

(75) Inventor: **Earl Ayle**, Chandler, AZ (US)

(73) Assignee: **Hexcel Corporation**, Dublin, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 84 days.

(21) Appl. No.: **11/726,451**

(22) Filed: **Mar. 22, 2007**

(65) **Prior Publication Data**

US 2008/0020176 A1 Jan. 24, 2008

Related U.S. Application Data

(63) Continuation-in-part of application No. 11/099,337, filed on Apr. 4, 2005.

(51) **Int. Cl.**
G10K 11/172 (2006.01)

(52) **U.S. Cl.** **181/292**; 181/213; 181/286;
181/288; 181/290; 181/291; 181/293

(58) **Field of Classification Search** 181/284,
181/286, 288, 290, 291, 292, 293, 213
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,989,422 A * 2/1991 Barlow et al. 66/170

5,785,919 A * 7/1998 Wilson 264/401
5,830,548 A * 11/1998 Andersen et al. 428/36.4
6,114,652 A * 9/2000 Clarke et al. 219/121.71
6,371,242 B1 * 4/2002 Wilson et al. 181/292
6,609,592 B2 * 8/2003 Wilson 181/292

FOREIGN PATENT DOCUMENTS

GB 2252076 A * 7/1992

* cited by examiner

Primary Examiner—Walter Benson

Assistant Examiner—Jeremy Luks

(74) *Attorney, Agent, or Firm*—W. Mark Bielawski; David J. Oldenkamp

(57) **ABSTRACT**

An acoustic structure that includes a honeycomb having cells in which septum caps are located. The septum caps are formed from sheets of acoustic material and include a resonator portion and a flange portion. The flange portion has an anchoring surface that provides frictional engagement of the septum caps to the honeycomb cells when the caps are inserted into the honeycomb during fabrication of the acoustic structure. An adhesive is applied to the anchoring surface of the septum caps after the caps have been inserted into the honeycomb cells to provide a permanent bond.

20 Claims, 6 Drawing Sheets

