United States Patent [19]

Stephens

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[54] **METHOD OF MAKING AN ACOUSTIC PANEL WITH A TRIAXIAL OPEN-WEAVE FACE SHEET**

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[51] **Int. Cl.**[4] **B32B 31/12**; E04B 1/74; E04B 1/82

[52] **U.S. Cl.** **156/292**; 156/313; 181/292; 181/294; 428/116

[58] **Field of Search** 181/286, 292, 294; 428/408, 116, 255, 257; 156/313, 292, 197

[56] **References Cited**

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[57] **ABSTRACT**

A method of producing an open, triaxial woven, acoustic face sheet useful in acoustic energy absorbing panels for aircraft engines or the like. The composite face sheet is formed from carbon fibers in an epoxy resin matrix and has about 25 to 33% open area. This face sheet has lower weight and superior and more uniform strength and stiffness than biaxial composite face sheets. The face sheet is made by first weaving carbon fiber tows at warp angles of +30° and −30° and a fill angle of 90°. The woven sheet is impregnated with epoxy as other resins in a manner which produces no rich or starved areas and no blocked openings. The resulting prepreg material may be stored for extended periods at reduced temperatures. The prepreg material is shaped on a suitable mold surface and the resin is fully cured, preferably in a vacuum bag assembly in an autoclave. The resulting sheet has very light weight, an excellent percentage of openings and high strength and stiffness. The sheet may be incorporated in an acoustic energy absorbing structure wherein the sheet has bonded to its outer surface a smooth microporous sheet such as a stainless steel woven wire cloth.

4 Claims, 4 Drawing Figures