



US006512834B1

(12) **United States Patent**
Banter et al.

(10) **Patent No.:** **US 6,512,834 B1**
(45) **Date of Patent:** **Jan. 28, 2003**

(54) **ACOUSTIC PROTECTIVE COVER
ASSEMBLY**

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(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/348,416**

(22) Filed: **Jul. 7, 1999**

(51) **Int. Cl.⁷** **H04R 25/00**

(52) **U.S. Cl.** **381/386; 381/189**

(58) **Field of Search** 379/439, 452;
181/175; 381/386, 189, FOR 151, FOR 140,
FOR 165

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,953,566 A	4/1976	Gore	264/288
4,071,040 A	1/1978	Moriarty	137/199
4,110,392 A	8/1978	Yamazaki	264/127
4,187,390 A	2/1980	Gore	174/102 R
4,949,386 A	8/1990	Hill	381/188
4,987,597 A	1/1991	Haerti	381/69
5,116,650 A	5/1992	Bowser	428/34.2
5,286,279 A	2/1994	Wu	95/45
5,342,434 A	8/1994	Wu	96/13
5,376,441 A	12/1994	Wu et al.	428/304.4

5,385,694 A	1/1995	Wu et al.	252/312
5,420,570 A	5/1995	Leitten et al.	340/574
5,460,872 A	10/1995	Wu et al.	428/304.4
5,462,586 A	10/1995	Sugiyama et al.	96/13
5,828,012 A	* 10/1998	Repolleet et al.	181/175

FOREIGN PATENT DOCUMENTS

GB	2064265 A	* 6/1981
JP	10-165787	6/1998

* cited by examiner

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(57) **ABSTRACT**

A sound-transmissive cover assembly is disclosed which provides protection from the ambient environment to transducer devices, such as microphones, loudspeakers, buzzers, ringers and the like. The cover assembly has a microporous protective membrane that is captivated at the outer region near the edges between two adhesive support systems. An inner unbonded region surrounded by the bonded outer region is provided so that the protective membrane can displace or move in response to acoustic pressure waves. The protective membrane design in conjunction with the configuration allows sound energy to pass through the protective membrane with very low attenuation, while being able to withstand long-term exposure to liquid intrusion. An embodiment of the cover assembly includes an attached acoustic gasket so as to seal and focus acoustic energy to housing apertures or openings.

16 Claims, 3 Drawing Sheets

