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[54] **METHOD FOR FORMING POROUS SINTERED BODIES WITH CONTROLLED PORE STRUCTURE**

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[*] Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

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[52] **U.S. Cl.** **428/613**; 264/42; 264/44; 501/81; 501/88

[58] **Field of Search** 428/613, 307.3; 264/44, 42; 501/84, 87, 96.1, 88, 81

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[57] **ABSTRACT**

The present invention is based, in part, on a method for combining a mixture of hydroxide and hydride functional siloxanes to form a polysiloxane polymer foam, that leaves no residue (zero char yield) upon thermal decomposition, with ceramic and/or metal powders and appropriate catalysts to produce porous foam structures having compositions, densities, porosities and structures not previously attainable. The siloxanes are mixed with the ceramic and/or metal powder, wherein the powder has a particle size of about 400 μm or less, a catalyst is added causing the siloxanes to foam and crosslink, thereby forming a polysiloxane polymer foam having the metal or ceramic powder dispersed therein. The polymer foam is heated to thermally decompose the polymer foam and sinter the powder particles together. Because the system is completely nonaqueous, this method further provides for incorporating reactive metals such as magnesium and aluminum, which can be further processed, into the foam structure.

32 Claims, 3 Drawing Sheets

