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McKillip

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(54) **AIRCRAFT ICING DETECTION SYSTEM**

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(58) **Field of Search** 340/945, 962, 340/966, 580, 963; 201/10, 14, 15, 16, 124; 702/125; 73/147, 170.26; 244/134

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(57) **ABSTRACT**

The present invention comprises a system and method for detecting icing conditions in a multi-mode aircraft by indirectly detecting ice accretion through the measurement of aircraft performance related characteristics. Indirect characteristics are used, sometimes in additional to traditional icing sensor input, because it is difficult to safely and effectively position icing sensors in aircraft that may fly in the hover mode or the fixed wing mode as well as modes in between. Typical indirect characteristics might include thrust and rotor response for a given torque. This information is compared to a model of the expected aircraft performance to determine if icing is likely to take place. For example, decreased thrust or lift for a given torque may indicate the onset of icing. Inputs from the traditional icing sensors may also be employed as additional useful, predictive data. A recursive filter having a variable gain feedback control produces an output predictive of icing conditions and provides warning information to a cockpit display as well as control signals the anti-icing equipment.

12 Claims, 3 Drawing Sheets