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(54) **ALGINATE-CONTAINING COMPOSITIONS FOR USE IN BATTERY APPLICATIONS**

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(58) **Field of Classification Search**

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See application file for complete search history.

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(57) **ABSTRACT**

A silicon-based anode comprises an alginate-containing binder. The many carboxy groups of alginate bind to a surface of silicon, creating strong, rigid hydrogen bonds that withstand battery cycling. The alginate-containing binder provides good performance to the anode by (1) improving the capacity of the anode in comparison to other commercially-available binders, (2) improving Columbonic efficiency during charging and discharging cycles, and (3) improving stability during charging and discharging cycles.

11 Claims, 20 Drawing Sheets