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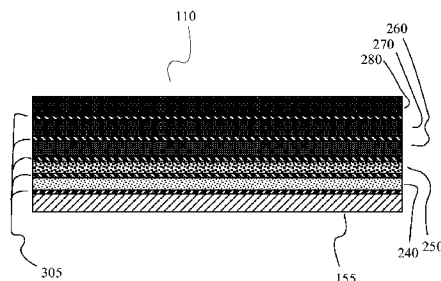


FIG 8

(57) Abstract: The invention disclosed herein provides for methods and apparatuses that yield electrodes having at least one functional gradient therein. In many embodiments, the electrodes comprise an electrode matrix having a plurality of layers, where at least two of the layers differs functionally, in composition, structure, or, organization. High-throughput electrode screening apparatuses are disclosed that include array formers and testers. Electrodes and battery cells arising from the methods and apparatuses disclosed herein are likewise disclosed. The methods, apparatuses, and resulting electrode and cell devices are, in some embodiments, ideally suited for use in lithium-ion batteries.

