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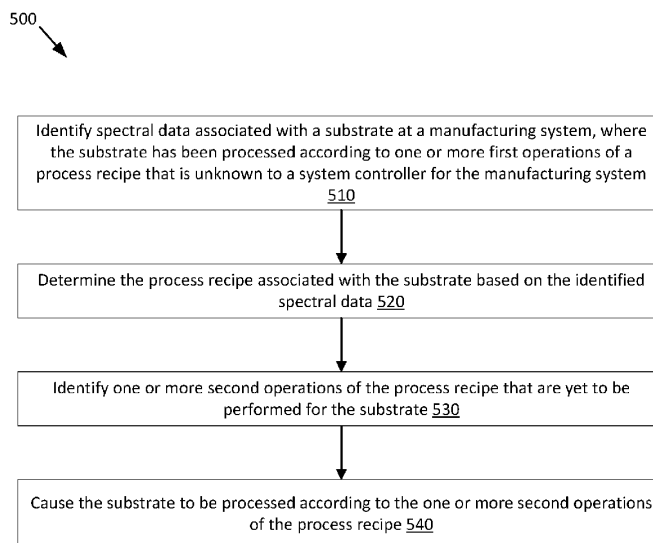


FIG. 5

(57) Abstract: Spectral data associated with one or more regions of a surface of a substrate is identified. The substrate has been processed according to one or more first operations of a process recipe that is unknown to a system controller for the manufacturing system. The spectral data is provided as input to a machine learning model that is trained to predict, based on given spectral data, a respective process recipe associated with the substrate and one or more operations of the respective process recipe that have already been performed. A determination is made, based on one or more outputs of the machine learning model, that the substrate is associated with the process recipe and that one or more second operations are yet to be performed. The substrate is caused to be processed according to the one or more second operations of the process recipe.

[Continued on next page]

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