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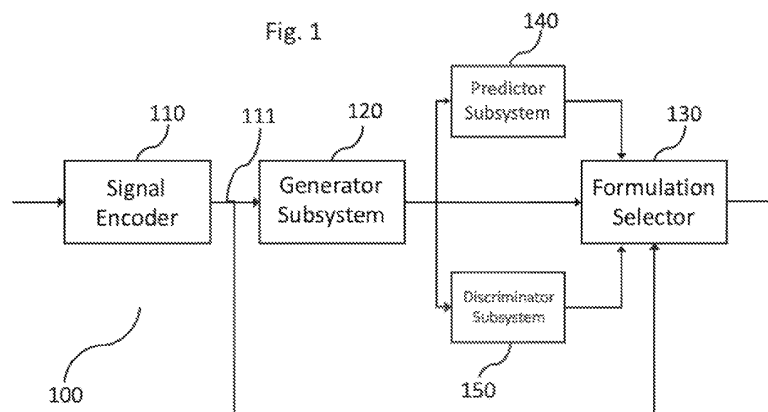
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(54) **Title:** METHODS, SYSTEMS AND APPARATUS FOR GENERATING CHEMICAL DATA SEQUENCES USING NEURAL NETWORKS FOR DE NOVO CHEMICAL FORMULATIONS



(57) **Abstract:** In some embodiments, a method includes receiving a set of target attributes associated with a chemical product formulation and a set of priority values of the plurality of target attributes. The method includes determining, based on (1) a first neural network, (2) the set of target attributes and (3) the set of priority values, a set of sample formulations. The method includes determining a set of scores based on the set of sample formulations. The method includes selecting, based on the set of scores and the set of target attributes, a sample formulation from the set of sample formulations having a score greater than remaining scores from the set of scores. The method includes determining an origin associated with the sample formulation. When the origin is included in a pre-determined group, the method includes generating a report including the sample formulation as the chemical product formulation.

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