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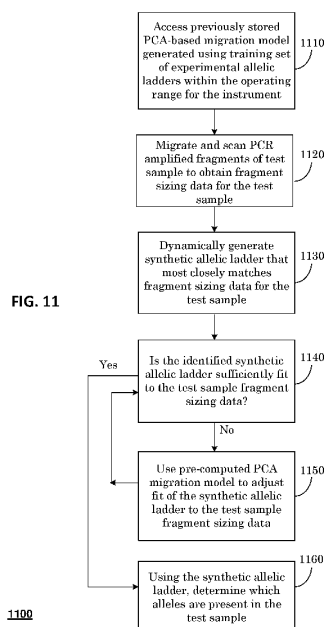
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(54) Title: DNA ANALYZER WITH SYNTHETIC ALLELIC LADDER LIBRARY



(57) Abstract: A method of testing a biological sample comprising deoxyribonucleic acid (DNA) molecules for presence of a plurality of alleles is described, wherein DNA fragments obtained using the biological sample and corresponding to different alleles have different, fragment sizes. A capillary electrophoresis (CE) instrument is used to obtain test fragment sizing data for the biological sample. A pre-computed model is used to dynamically determine one or more synthetic allelic ladders, where the pre-computed model is derived via analysis of a plurality of fragment sizing data sets obtained from a plurality of previous allelic ladder sample runs conducted using CE instruments. The one or more synthetic or experimentally derived allelic ladders are used to find a sufficient fit to the test fragment sizing data to identify which of the plurality of alleles are present in the biological sample. The statistical analysis may comprise a principal component analysis including two principal components.