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- (81) **Designated States** (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,

(54) **Title:** AUTONOMOUS CELL IMAGING AND MODELING SYSTEM

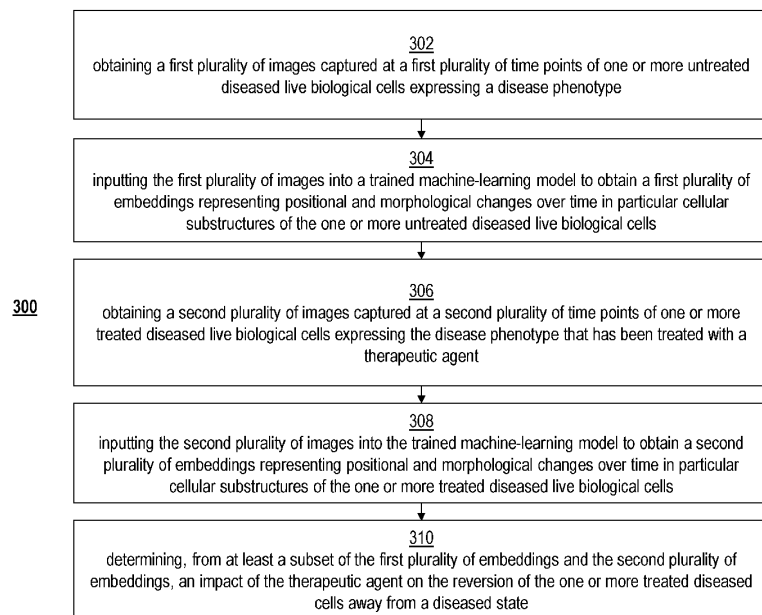


FIG. 3

(57) **Abstract:** The present disclosure relates generally to an autonomous cell imaging and modeling platform, and more specifically to machine-learning techniques for using microscopy imaging data to continuously study live biological cells. The autonomous cell imaging and modeling platform can be applied to evaluate various cellular processes, such as cellular differentiation, optimization of cell culture (e.g., in-plate cytometry), disease modeling, histopathology imaging, and genetic and chemical screening, using a dynamic universal imaging system. In some embodiments, the platform comprises a set of label-free computational imaging techniques, self-supervised learning models, and robotic devices configured in an autonomous imaging system to study positional and morphological characteristics in particular cellular substructures of a cell culture in an efficient and non-destructive manner over time.

[Continued on next page]

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