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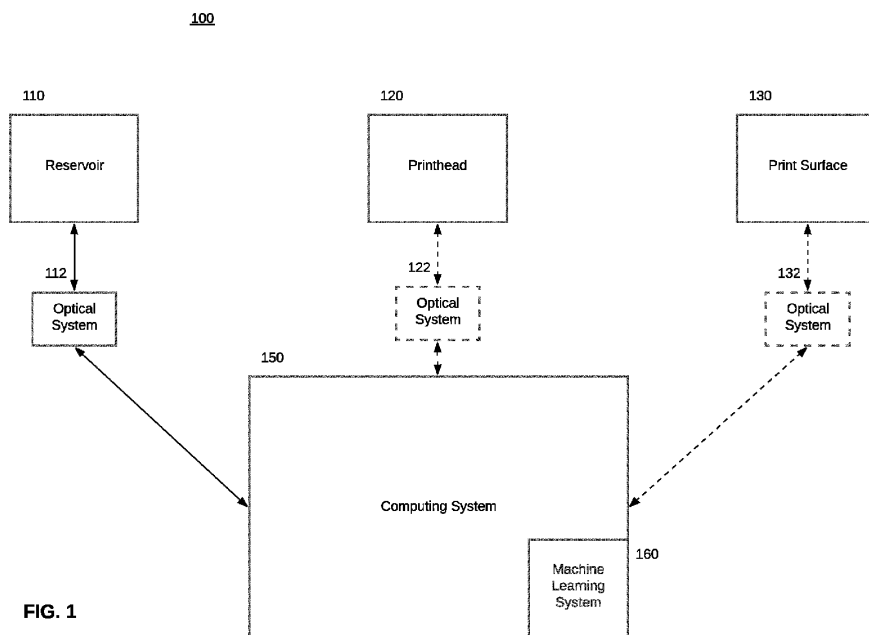


FIG. 1

(57) **Abstract:** In a bioprinting system and method, a bioprinter may include one or more reservoirs, a printhead, and a print surface on which the bioprinting is dispensed. An optical system may collect imaging data of a plurality of cells within a cross-linkable material before, during and/or after passage of the plurality of cells through the bioprinting system. A computing system may process the imaging data to determine a quantity, distribution, concentration, and/or morphology of the plurality of cells. A machine learning system compares characteristics of the plurality of cells before, during and/or after passage of the plurality of cells through the bioprinting system to user-established cell morphologies corresponding to physical properties of cells and/or cell aggregates within a predetermined tolerance. Additionally or alternatively, the machine learning system compares characteristics of the plurality of cells at one stage in the bioprinting system to characteristics of the plurality of cells at another stage in the bioprinting system.

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