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(54) Title: DUAL SENSING END EFFECTOR WITH SINGLE SENSOR

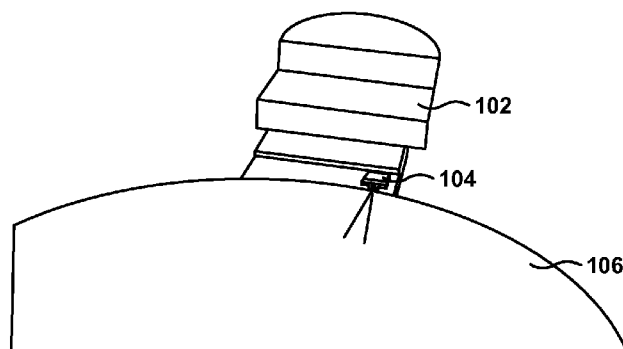


Fig. 1

(57) Abstract: Systems, methods, and computer programs are presented for an end effector with a dual optical sensor. One end effector includes an arm, a mapping sensor, and a load sensor. The arm has one end connected to a pivoting joint, and a light signal is routed around the arm through a single light path. The mapping sensor is used for identifying the presence of the wafer when the wafer is not loaded on the end effector. The load sensor is used for identifying presence of the wafer on the end effector or when the wafer is loaded on the end effector. The load sensor is defined by a second segment in the single light path such that the wafer intersects the second segment and interferes with the single light path when the wafer is loaded. A control module determines if an interruption in the single light path corresponds to an interruption of the single light path in the mapping sensor or the load sensor. As a result, one single light sensor is used to sense for two different conditions in the end effector.

