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(54) Title: LIFT PIN SYSTEMS AND METHODS

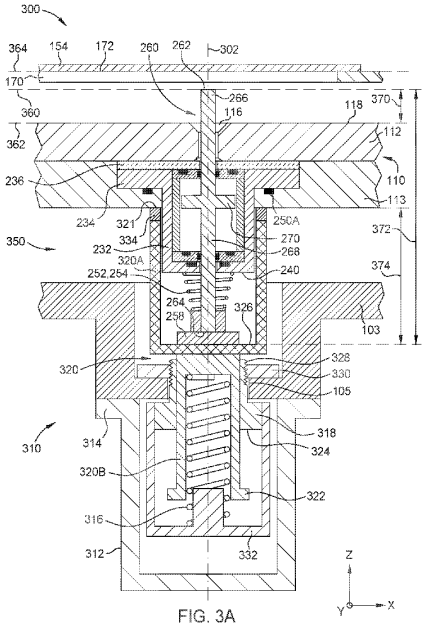


FIG. 3A

(57) Abstract: A substrate support assembly includes a substrate support that is moveable by a shaft between a raised position and a lowered position below the raised position. A lift pin is disposed in a hole through the substrate support, and is movable vertically with respect to the substrate support. In one implementation, the lift pin includes a shaft with a longitudinal rib. In another implementation, a lift pin system includes a seal member in a lift pin housing that forms a seal against the lift pin. In another implementation, a lift pin system is adjustable to change a distance of an end of the lift pin from a datum. In another implementation, a lift pin system includes a hoop plate to which the lift pin is coupled. The hoop plate is coupled to an actuating plate via a plunger. The actuating plate is biased against an arm coupled to the shaft.

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