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- (71) **Applicant:** **APPLIED MATERIALS, INC.** [US/US];
3050 Bowers Avenue, Santa Clara, California 95054 (US).
- (72) **Inventors:** **WEAVER, William T.**; 13708 Overland Pass,
Austin, Texas (US). **YUDOVSKY, Joseph**; 594 Smokey
Court, Campbell, California 95008 (US). **BLAHNIK, Jef-**
frey; 8132 Beauregard Drive, Volente, Texas 78641 (US).
- (74) **Agent:** **BLANKMAN, Jeffrey I.**; SERVILLA WHITNEY
LLC, 33 Wood Ave. South, Suite 830, Iselin, New Jersey
08830 (US).
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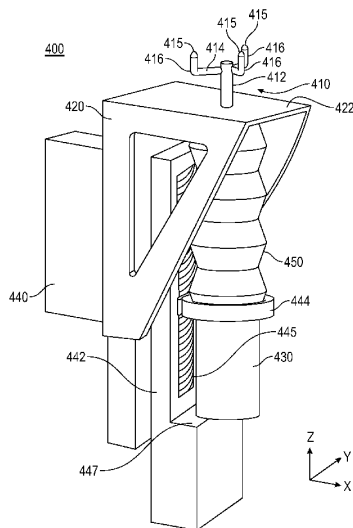


FIG. 7

(57) **Abstract:** Apparatus and methods for rotating wafers during processing include a wafer rotation assembly with a support fixture connected to a shaft and a wafer transfer assembly with a robot blade with an opening therethrough, the opening sized to allow the support surface of the support fixture to pass through the opening. A first actuator is connected to the wafer rotation assembly to rotate the support fixture assembly about an axis of the shaft. A second actuator is connected to the wafer rotation assembly to move the support fixture assembly a stroke distance along the axis of the shaft. Process kits including the wafer rotation assemblies and robot blades with openings can be used to retrofit existing mainframe processing chambers.

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