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(54) Title: SUBSTRATE PROCESSING SYSTEM AND METHOD

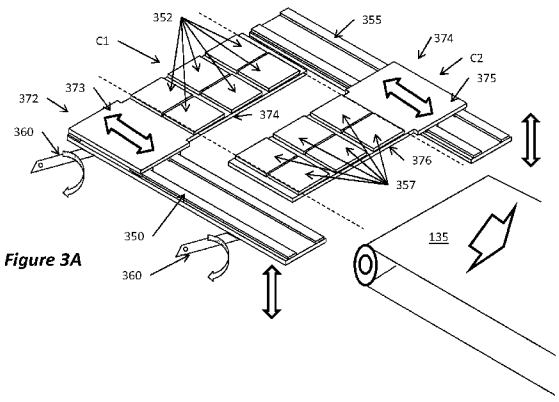


Figure 3A

(57) Abstract: A system for processing substrates has a vacuum enclosure and a processing chamber situated to process wafers in a processing zone inside the vacuum enclosure. Two rail assemblies are provided, one on each side of the processing zone. Two chuck arrays ride, each on one of the rail assemblies, such that each is cantilevered on one rail assemblies and support a plurality of chucks. The rail assemblies are coupled to an elevation mechanism that places the rails in upper position for processing and at lower position for returning the chuck assemblies for loading new wafers. A pickup head assembly loads wafers from a conveyor onto the chuck assemblies. The pickup head has plurality of electrostatic chucks that pick up the wafers from the front side of the wafers. Cooling channels in the processing chucks are used to create air cushion to assist in aligning the wafers when delivered by the pickup head.

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