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(19) **United States**(12) **Patent Application Publication** (10) **Pub. No.: US 2023/0230829 A1****NAKABAYASHI et al.**(43) **Pub. Date: Jul. 20, 2023**(54) **SEMICONDUCTOR WAFER PROCESSING APPARATUS AND METHOD OF MANUFACTURING SEMICONDUCTOR ELEMENT**(22) Filed: **Dec. 29, 2022**(30) **Foreign Application Priority Data**

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CPC ..... **H01L 21/0201** (2013.01)(57) **ABSTRACT**(72) Inventors: **SHOSUKE NAKABAYASHI**, Nisshin-shi (JP); **JUNJI OHARA**, Nisshin-shi (JP); **MASATAKE NAGAYA**, Nisshin-shi (JP); **CHIAKI SASAOKA**, Nagoya-shi (JP); **SHOICHI ONDA**, Nagoya-shi (JP); **JUN KOJIMA**, Nagoya-shi (JP); **DAISUKE KAWAGUCHI**, Hamamatsu-shi (JP); **RYUJI SUGIURA**, Hamamatsu-shi (JP); **TOSHIKI YUI**, Hamamatsu-shi (JP); **KEISUKE HARA**, Hamamatsu-shi (JP)

A method of manufacturing a semiconductor element includes formation of a modified layer, detection of a first region, and cutting of a semiconductor wafer. In the formation of the modified layer, a laser is irradiated on the semiconductor wafer to form the modified layer extending along a surface of the semiconductor wafer inside the semiconductor wafer. The surface of the semiconductor wafer includes a peripheral portion having the first region and a second region. The first region is a region in which the modified layer is not located, and the second region is a region in which the modified layer is formed. In the cutting of the semiconductor wafer, the semiconductor wafer is cut at the modified layer starting from the second region.

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