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(54) **ENHANCED NOZZLE FOR
DISAGGREGATED DIE HANDLING DURING
THERMAL COMPRESSION BONDING**

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(57) **ABSTRACT**

This disclosure describes nozzle designs for holding disaggregated die flat in a bonding process. The nozzle designs may have trenches extending radially outward from the center of the nozzle to the corners, such as in a snowflake pattern. The trenches may be positioned to be axially unaligned with any mold dishes of the disaggregated die when lifting the disaggregated die. The trenches may have a depth of at least 200 micrometers to allow for sufficient air flow to prevent warpage of the disaggregated die.

